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Records and descriptions of Tabanidae from Southern Africa (Diptera)

by

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SYNOPSIS

The following twelve new species are described and figured: *Philoliche* (*Phara*) *andrenoides; Mesomyia* (*Perisilvius*) *tinleyi, marieps; Tabanocella schofieldi; Tabanus saxicolus; Haematopota mephista, megaera, montisdraconis, quathlambia; Cydistomyia* (*Amanella*) *ingridina, ignota, cooksoni.* The extent of variation in *Cydistomyia pondo* (Oldroyd) and *Cydistomyia imbecilla* (Karsch) is discussed and new records are given for these species. *Tabanus corax* Loew is redescribed. New records are given for the following species: *Sphecodemyia lamborni* Austen, *Chrysops laticeps* Austen, *Cydistomyia medialis* (Oldroyd). The name *Mesomyia* Macquart, 1850, is not considered to be replaced by *Erodiorhynchus* Macquart, 1838, as the latter is regarded as a valid genus and not a subgenus. *Amanella* Oldroyd is retained as a subgenus of *Cydistomyia* Taylor, and *Canalicula* Oldroyd is considered not to be distinct from *Amanella.* A key is given to the species of *Amanella* without grooved palpi. The three species *Tabanocella denticornis* (Wied.), *T. zoulouensis* (Ric.) and *T. schofieldi* n.sp. are compared and keyed.

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INTRODUCTION

During the past few years material of Oldroyd's genus *Amanella* has gradually been accumulating at the Natal Museum. There were new records of already described species, a dark form of the species *A.imbecilla* (Karsch), and three new species. The work on this group comprises a large part of this paper. It also contains a discussion on the recent synonymy by Mackerras (1964) of *Amanella* in the genus *Cydistomyia* Taylor, and my reasons for retaining *Amanella* as a subgenus. There are also other new records of previously described species, *Sphecodemyia lamborni* Austen, *Chrysops laticeps* Austen and *Tabanus corax* Loew, with a redescription of the last-mentioned species. Finally there are descriptions of nine new species: two closely related species of *Mesomyia* (*Perisilvius*), *tinleyi* and *marieps* from Gwalaweni in Zululand and Mariepskop in the E. Transvaal respectively; *Tabanus saxicolus* from the Natal Drakensberg; *Philoliche* (*Phara*) *andrenoides* from the Natal Drakensberg and the Hogsback in the Eastern Cape; *Tabanocella schofieldi* from the Tugela River Mouth on the Zululand coast, with a discussion about its relationship with *T.denticornis* (Wiedemann) and *T.zoulouensis* (Ricardo); finally four species of the genus *Haematopota*, two from the *tumidicornis* group, *H.mephista* and *H.megaera*, and two from the *hirta* group, *H.montisdraconis* and *H.quathlambia*. This is the first record of the *hirta* group in South Africa.

Here I would like to mention that the ratios I have given for the frons index are the averaged width of the frons at the vertex and at the lower angles of the eyes against the length of the frons. Also, the colours given in the detailed descriptions are as they are seen under a microscope using an ordinary, not a colour-corrected, globe, while those of the general appearance are as they appear macroscopically by daylight. I have tried to make this clear in the text where there seems to be a contradiction. Often the colours appear lighter microscopically, for instance a macroscopically blackish tabanid is usually dark brown.

ACKNOWLEDGEMENTS

It gives me great pleasure to acknowledge here, with much gratitude, all the help I have received.

First of all, Mr. H. Oldroyd for his patience in helping sort out various problems and for all the time he has spent on many identifications, often with very poor material which was quite beyond my abilities. Also Mr. David Cookson, whose many contributions of material have been of great interest and of very high quality. Other people to whom I am most grateful for excellent specimens, the good condition of which has been an enormous help in this group (in which colouring and pattern have to be relied upon to such an extent) are: Mr. T. Schofield, Mr. K. Tinley and Mr. T. Oatley. Also Dr. A. Hesse and Mr. F. Gess of the South African Museum for their prompt assistance with comparative material, and Dr. H. K. Munro, Dr. G. van Son and Mr. J. S. Taylor for the loan of valuable and interesting material. Finally, but most of all, my husband, Mr. Brian Stuckenberg, without whose help this paper would have been quite impossible. It is a pleasure to have this opportunity to acknowledge his help and encouragement over the past years and with details of this paper, from the important taxonomic problems to the time consuming trivialities of the final details with much patient intermediate assistance, including with the calculations, and for suggesting the study of this interesting if very frustrating group.

Part of the material discussed in this paper was collected by B. R. Stuckenberg during the tenure of grants awarded by the South African Council for Scientific and Industrial Research.

NEW RECORDS AND A REDESCRIPTION

Genus *Sphecodemyia* Austen

Sphecodemyia lamborni Austen

Sphecodemyia lamborni Austen 1937, Proc. zool. Soc. Lond. **107** C, p. 32.

For the full details of this species see Oldroyd (1957, p. 133).

New record of this species: 1 ♂ from the Ndumu Game Reserve, Ingwavuma Dist., N. Zululand, Dec. 1960, collector T. Oatley.

The species was previously known only from Fort Johnston, Malawi, and was reared from the immature stages collected in rot holes high up in *Sterculia* and *Brachystegia* trees. Both these species of trees are present at Ndumu, but it is very much further south than the original locality. Presumably these tree-top species are very much more widespread than our present knowledge of them would lead us to believe.

Genus *Chrysops* Meigen

Chrysops laticeps Austen

Chrysops aticeps Austen 1910, Ann.Mag.nat.Hist. (8) **6**, p. 343.

For morphological details about this species see Oldroyd (1957, p. 84), and for ecological notes see Tinley (1964).

A long series has been caught by Mr. K. Tinley at Lake St. Lucia and Ndumu Game Reserve in Zululand. Mr. Oldroyd has confirmed that this species is *laticeps*; it is distinct from *fuscipennis* Ricardo, a matter about which there was previously some doubt. It is rather variable species both in size and the extent of the yellow abdominal bands.

Genus *Tabanus* Linn.

Tabanus corax Loew

Tabanus corax Loew, 1836, Wien ent. Monatschr. **7**, p. 10; Bequaert, 1930, Harvard Afr. Exped. Liberia **36**, p. 931; Oldroyd, 1954, Horseflies Ethiop. Reg. II, p. 224.
NOT *Tabanus corax*, Neave, 1915, Bull. ent. Res. **5**, p. 308 (= *xanthomelas* Austen).

This species was originally described by Loew on a specimen from Bloemfontein, O.F.S. The description is brief and no material seems to be known except the holotype in v. Roeder's collection at Halle. In a collection loaned by Mr. C. Jacot-Guillarmod to the Natal Museum were two large black tabanids answering closely to the description given by Loew, except for the colour of the first antennal segment. Later a third specimen was sent by Mr. H. Paterson. The first two came from Monethis near Teyateyaneng and Mahlatsa in Basutoland, and the third from Giant's Castle in the Natal Drakensberg; these are indubitably the same species. Despite the colour difference, I feel these can only be *T.corax*, especially as minute colour variations can be seen when the available specimens are well lit and considerably magnified. I have not seen the type nor has Oldroyd, and as the description given by Loew is very brief I will take this opportunity to record more of the details.

The description given by Loew is: "♀ Totus ater, subopacus, oculis nudis, infero frontis angustae, callo quadrangulato, subobsoleto, antennarum articulo primo lutiusculo, galericulato. Long. corp. 10⅔ lines (= 23 mm.) Long. al. 9 lines.

Obs. A. Tabano noctis, qui apicem alarum haber, alis totis atris differt."

Mr. Jacot-Guillarmod has written that *T.corax* is common in Basutoland at a certain altitude but is difficult to catch. Unfortunately he did not specify the altitude and although my husband and I spent three weeks in January 1963 collecting in Basutoland, we did not see one. It may be as well to mention here that the locality "Bloemfontein" is suspect, and the specimen may have been so labelled because this was the nearest large town. As the species is known to be in mountainous regions, the area around Bloemfontein appears most unsuitable. The possibility of there being a second black species in the vicinity seems remote.

In general appearance this is a large, altogether black fly, dully shining. Close microscopic examination with suitable lighting reveals a diffusion of reddish-brown in certain areas, but not pattern of spots or triangles; wings dark brown, slightly bleached at the cell centres; legs black, the orange pulvilli and empodia providing the only spots of bright colour in this sombre fly.

T.corax (fig. 1) is a member of the *ruficrus* group on account of the overall size, elongate frons, as well as the widened and distinctly grooved basal area of the costa. In the key to the species of the *ruficrus* group (Oldroyd 1954, p. 203) the three black tabanids run down to *T.aquillus* Surcouf which has "antennae entirely black". However this species from Gambia has a white band on the frons and yellow on the face, buccae and laterally on the first four abdominal segments. There is also a certain amount of yellowish and white pubescence, whereas *corax* has some greyish pubescence, a black frons and no yellowish hairs. The other species of the *ruficrus* group with the dark abdomen can be separated from the totally dark *corax* as follows: *ruficrus* Palisot de Beauvois from the Gold Coast, Nyasaland, Angola and Sudan, has wings with a clear membrane and infuscated veins and tibiae reddish with some orange hairs; s.sp. *fuscomarginatus* Ricardo has middle and hind femora bright red and tibiae bright orange; *brumpti* Surcouf from Sierra Leone has traces of spots and legs that are mainly reddish orange.

In shape and colour *T.corax* is remarkably like a ♂ *biguttatus*, but is separated from this very widespread species by the lack of abdominal triangles and the uniform wing colouring. An even more similar member of the group is the ♂ *xanthomelas* Austen in which the wings are wholly dark, and two small, white spots on tergites 3 and 4 constitute the only pattern. In the case of greasy specimens the distribution may be the only distinguishing character; *xanthomelas* is not known south of Rhodesia. Greasy ♀ *xanthomelas* and *pluto* Walker also look much like *corax* as the abdomen then becomes black, but there are always light bands on the face and traces of them on the tergites even when extensively rubbed.

Head: Frons (fig. 1) narrow convergent, with black tomentum and short, shining recumbent black hairs, slightly longer and erect at vertex. Callus shining dark red-brown almost black. Lower callus approximately rectangular or broadly mitre shaped, longer than wide, not meeting eyes. Calli very narrowly united by a thin line, or may be broader in rubbed specimen. Upper callus indistinctly defined, an elongate, narrow, semi-matt band, reaching the slightly broader ocellar tubercle. Ocellar tubercle small, situated well below vertex, with three minute, vestigial ocelli. Subcallus almost flat, with a few wrinkles; tomentum thin, mainly reddish brown, but dark slate at edges, easily rubbed. Parafacials with dark grey-brown tomentum, that of face lighter, more brownish; face, parafacials and buccae with black hairs, especially long on lower buccae. Antennae: (fig. 1) 1st segment approximately triangular, upper angle projecting over very small 2nd; both dully shining, very dark brown, nearly black, hairs stiff, short; black. In one specimen from Monethis, outside of lower apical corner of 1st segment faintly dark yellowish, inner surface black. Third segment with steep dorsal angle, sharply down curved to tapering apex, black or near black, may have dull orange brown streak beneath, along outer basal edge, extending to slight vertical angle. Remaining segments small, sharply tapering to pointed last segment, black. The Natal *corax* has entirely black antennae except for slight lightening of lower edge of 3rd segment.

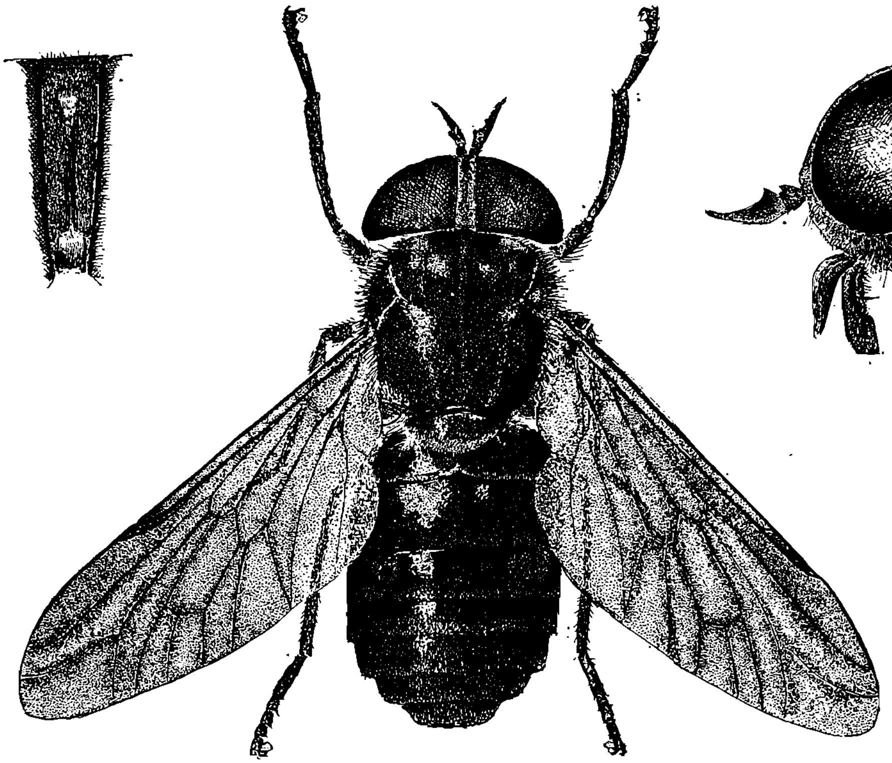

Fig. 1. *Tabanus corax* Loew. Female, with head in lateral view, and frons.

Thorax: Mesonotum dully shining, near black, with black hairs, and very thinly grey pollinose. Faint, very narrow traces of orange-brown median and sublateral stripes, lateral borders broadly, diffusely, dark orange-brown, with greater concentration of pollen, Scutellum: disc with black centre and inconspicuously orange-brown border. Pleura very dark brown, hairs black, especially dark on upper mesopleuron and pteropleuron. Pollen thin, grey. Indefinite yellowish patches along pleural sutures.

Abdomen: In outline fairly broad, approximately conical. Dorsum dark, nearly black. shining, 2nd, 3rd and 4th (and maybe 5th very slightly) with indistinct lightening of colour sublaterally to dark red-brown, from anterior border to just past midline, leaving intense black medially and on hind margins. This is no clear-cut pattern, but a dim gradation of colour requiring good lighting and concentrated study to determine at all; the superficial appearance is definitely of a uniform black. Hairs short, stout, shining black and numerous. Venter slightly shining dark reddish-brown on fore $\frac{3}{4}$ of sternites, with broad black hind margins, more obviously coloured than tergites, hairs as on dorsum, not quite so numerous.

Legs: Coxae like pleura. Femora very dark, virtually black, with numerous fairly long black hairs. Tibiae very dark, reddish-brown; fore tibiae darker than hind and middle ones; all joints narrowly lighter; reddish hind tibiae with crest of strong black hairs on antero-dorsal surface except at extreme distal end, hairs suberect towards middle, progressively more reclinate apically. Tarsi black with mostly black hairs, orange hairs ventrally, pulvilli brilliantly light orange-yellow.

Wings: Stained dark brown, indistinctly lighter in centres of cells, staining definitely darker along veins, especially on fore margin, present also along hind margin. Costal cell uniformly dark. Stigma very dark brown. Halteres: dark brown stalk, knob dark brown, may be tinged with orange-brown apically.

Note: Although the general appearance of this tabanid must be stressed as being black, all have some reddish colouring apparent only microscopically. One Basutoland specimen has more reddish-brown colouring throughout and a faint yellowish patch on the first antennal segment. Because of that, and the improbability of finding two large black tabanids so close geographically, I have very little doubt that this really is *T.corax.*

Material examined: 2 ♀♀, Monethis near Teyateyaneng, Basutoland A. Jacot-Guillarmod. 1 ♀, Giant's Castle Game Reserve, Natal Drakensberg, 28.11.57, H. Paterson. In Natal Museum.

DESCRIPTIONS OF NEW SPECIES

Genus *Philoliche* Wiedemann

Philoliche (Phara) andrenoides n.sp.

In Oldroyd's key to the subgenera of *Philoliche* (1957, p. 322) this species runs down to *Phara* Walker; it has the bases of the antennae definitely close together, the face is bare and shining, and it is a large black and yellow species with a broad abdomen.

In the key to the species (*loc. cit.* p. 412), it runs down to *quinquemaculata* (Austen), which also has pale tibiae with black tips. Another closely related species with pale tibiae but reddish tips, *bivirgulata* (Austen), is also known from Natal, but the three are easily separated: *andrenoides* is the only one with a completely banded abdomen; *quinquemaculata* has white lateral tufts on the 2nd tergite and median triangles of hair on the 4th to 7th; *bivirgulata* has a hind marginal fringe of golden hairs on the 1st and 2nd and sometimes the 4th tergites and median triangles of golden hairs on the 3rd, 4th and 5th tergites. Both *bivirgulata* and *quinquemaculata* are woodland or forest dwellers, whereas *andrenoides* inhabits high altitude open grassland, although presumably it breeds elsewhere in damper places.

Among the South African representatives of the subgenus, pale lateral tufts, hind margins and median triangles have been combined in many ways on dark ground colours to produce abdominal patterns varying from plain to highly ornamental, but *andrenoides* appears to be the only species with a completely banded dorsum.

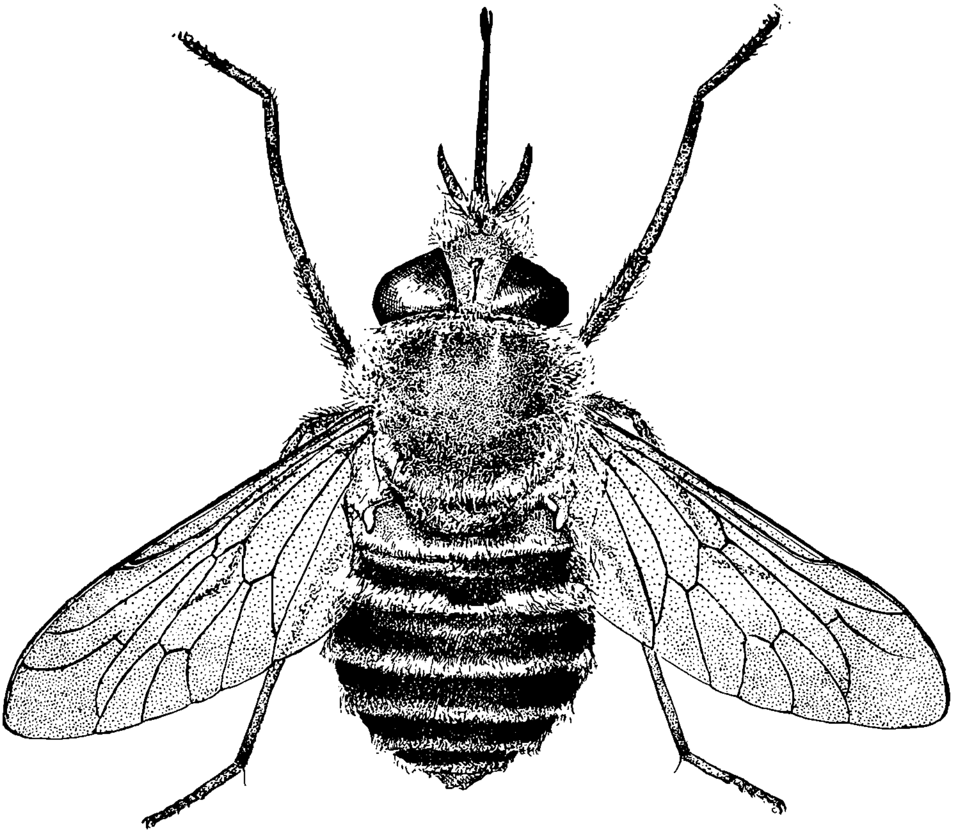

Fig. 2. *Philoliche* (*Phara*) *andrenoides* n.sp. Holotype.

It is interesting to speculate about interrelationships but the localities from which each species is known are often widely separated, and give the impression that collecting has not been thorough enough to indicate the true distribution. For instance, *quinquemaculata* is known from King William's Town (E. Cape), Port St. Johns (Pondoland), Howick (Natal), Ubombo (Zululand); *bivirgulata* from "Marikburg" (almost certainly Maritzburg, Natal), Boshoff's Road and the Karkloof Range (Natal), Eshowe (Zululand); *chrysopila* from Namididi (Malawi) and Ngorogoro (Tanganyika). It is the same with many of the species. The areas between are not always unsuitable, but the flies, though large and conspicuous, are strong, fast fliers and may have simply evaded capture. They may well pass unobserved as they do not all appear to attack humans, and their buzz can easily be mistaken for that of a large bee. For these reasons the Cathedral Peak specimen might not have been caught at all, except that it flew into a stationary car. Many more were flying past on the top of a ridge, but although my husband and I tried, we could not catch another. Some time later another specimen from the Hogsback was donated to the Natal Museum by Mr. J. S. Taylor. This is a smaller, paler fly, the banding of the abdomen is entirely pale yellow-gold, not white anteriorly and brassy yellow posteriorly as in the first specimen.

In passing it may be of interest to note that white hairs occur at the base of the abdomen only (if they are present), and darker, yellow or orange ones at the apex, throughout the group.

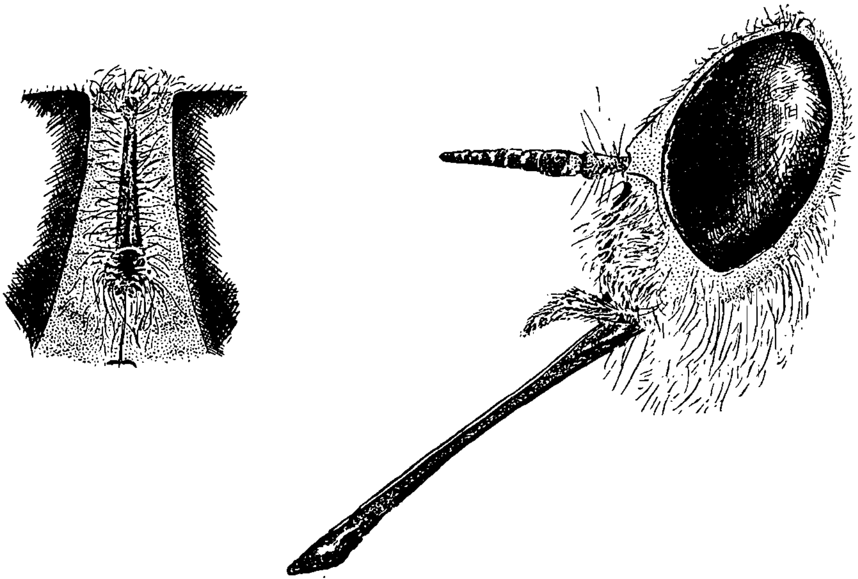

Fig. 3. *Philoliche* (*Phara*) *andrenoides* n.sp. Head in lateral view, and frons.

P.andrenoides (fig. 2) is a handsome, boldly marked, bee-like species. The yellow tomented frons with the linear callus, the practically unmarked thorax with a fine bronze pile, and the conspicuously banded abdomen are the main distinguishing characteristics. The tibiae are pale with dark tips, and the wings yellow-brown, faintly smoky at the apex and along the hind margin.

Head ♀. Frons (fig. 3) narrow, markedly divergent, tomentum light golden. Callus bare, wrinkled, shining black, concave, spherical below with elongate triangular extension to dark ocellar tubercle. Long hairs fan out from edge of callus, blending from pale at base where hairs are proclinate, through light golden along sides of callus to darker gold at vertex where there is a patch of shorter, erect hairs. Facial lobe swollen, shining black, bare centrally, with a little white tomentum and many long hairs at sides. Buccae and lower occiput fringed with long white hairs and covered with greyish-white tomentum. Palpi dull black, basal segment thinly tomented, with long white hairs; apical segment slightly bulging on basal half with slender pointed apex, extreme apex dark orange-gold, with concolorous hairs, bright yellow-gold hairs elsewhere. Proboscis moderately long, black. Antennae (fig. 3) mainly black; reddish yellow at apical margins of 1st and 2nd segments, hairs on 1st long white, on 2nd short white; 3rd orange narrowly at base, and having, in common with terminal segments, a velvety-black appearance.

The Hogsback specimen does not agree with the above description in all details. The tomentum of the frons is pale greyish-yellow. The lower callus is broadly triangular in outline, and has fewer hairs, while the hairs at the sides of the linear extension are shorter. As the specimen is not in good condition, some of the hairs may have been lost through rubbing, but nevertheless, the appearance is of shorter, fewer hairs. The shape of the palpi agrees well with the Drakensberg specimen, but the hairs are black, golden only at the extreme apex.

Thorax: Mesonotum and scutellum black, very thin, brownish pollinose. Hairs shining brassy golden; being erect they appear rather sparse when viewed dorsally, but are very conspicuous laterally. Sublaterals on mesonotum faint, brownish hairs denser on these and on mid-line. Notopleural and postalar lobes have particularly long, dense hairs. Two irregular prescutellar patches, paler, more heavily pollinose. Pleura black-brown, with thin whitish or greyish tomentum. Mesopleuron dorsally with many long brassy hairs. Elsewhere long white hairs which are sparse, except on pro-, ptero-, and meso-pleura where they are in relatively long tufts. Hypopleuron bare. The Hogsback specimen differs only in the slightly shorter bronze pile on the mesonotum and scutellum.

Abdomen: Dorsum black, shining, without tomentum except on the first tergite where it is thin and pearly grey. On fore parts of tergites hairs short, dark, practically invisible unless seen in oblique lighting; first tergite exceptional, covered with long, white hairs. Hind margin of first tergite with broad band of long silvery-white hairs; second hind margin greatly expanded laterally, hairs long, shining-white, but band dips centrally to a narrow bar of golden hairs, over which is indefinite triangle of white hairs; from third onwards only extreme edges white, shading into brilliantly brassy golden in straight bands along hind margins except on centres where thicker regions seem to be indications of median triangles. Golden band especially thick on sixth tergite. Venter shining black with broad white hind margins of hair except on mesopleural epimeron which is completely white tomented, and first sternite which has broad central arc of tomentum and brilliantly shining lateral areas. Mesopleural epimeron has moderate number of long, white hairs; first sternite has no hairs at all and thereafter hairs are short, black, recumbent, except centrally on the anterior part of second sternite and on hind margins where they are long, silky and white.

The Hogsback specimen differs markedly in certain respects. The hairs throughout on the dorsum are golden yellow, none are white and those posteriorly are only slightly darker than the ones on the first two tergites. Also, instead of having black hairs anteriorly, all the hairs on the second tergite are yellow, but those on the fore part are at such an angle as to be inconspicuous in dorsal view, so the hind margin appears broad laterally and narrow medially as it does in the holotype. The arc of tomentum on first sternite is more restricted and the lateral shining patches are correspondingly larger, also paler, a reddish-brown.

Legs: Coxae like pleura, with fairly dense, long white hairs. Femora subshining, black, pale at extreme apex, hairs medium long, white. Tibiae yellowish-white basally, and dark brown apically on basal three segments of middle and hind tarsi, fore tarsi entirely brown except for first segment. The Hogsback specimen agrees well in detail except only that the colouring is slightly paler and the light bases of the tarsal segments less well defined.

Wings: Hyaline, tinged yellow-brown, darkest along costal and subcostal cells. Apically slightly smoky, root of wing dark. First posterior cell closed and stalked, all other cells open; R_4 with appendix. Squamae white. Halteres with stem brown, knob creamy-white with brown patch above and below.

Notes: P.andrenoides is deceptively bee-like in appearance and behaviour when alive. Several were flying on a prominent ridge, which is frequented by Eland (*Taurotragus oryx* Pallas), and which runs at right angles to the main Drakensberg escarpment. The vegetation is *Themeda* grassland, and the sides of the ridge slope steeply down to river valleys containing riverine forest. In flight *andrenoides* is almost too fast for the eye to see, and buzzes loudly. The unique specimen was caught when it flew into a stationary car. Although we have frequently visited the Drakensberg, we have seen this species only the one time, and have never been bitten by it.

There are no notes with the Hogsback specimen. In spite of the differences, which I have noted and the geographical separation, my opinion is that these are the same species, and the variation is not more than is to be found in other species of the subgenus. Future collecting may or may not support this assumption.

Size: Length without antennae 14·0—15·5 mm. Wing length 12·0—13·0 mm.
Frons index 1·72—1·76.

Holotype in the Natal Museum, 1 ♀, Cathedral Peak, Natal Drakensberg, Stuckenberg, 6.II.61. Other material, 1 ♀ Hogsback, Alice District, E. Cape Province, J. S. Taylor, 26.XII.52.

Genus *Mesomyia* Macquart

The genus *Mesomyia* covers a considerable number of species, many of them very diverse. Three subgroups are especially outstanding: *Bacloceras* Austen, *Pronopes* Loew, and *Erodiorhynchus* Macquart. Mainly because of the reasons given by Oldroyd (1957, p. 200-203) when he discusses the Tribe Bouvieromyiini and the few genera he recognises in it, and also because of the lack of any further evidence, to my mind it seemed best to leave the whole problem of the scope of the genus for future extensive investigations. However, Travassos Santos Dias and Sousa (1957), preferring to consider the priority rights of *Erodiorhynchus* (1838), have used this as the correct name for the whole genus *Mesomyia* (1850). This will mean extensive changes, for *Mesomyia* is so widespread, and

Erodiorhynchus a little known S. African group of three species, limited to the Cape Province, probably only the Western Cape Province.

Although having no first hand knowledge of *Bacloceras* and *Pronopes* (with the exception of a single very strange-looking species of the latter), and also bearing in mind Oldroyd's assurance that "there are strong grounds for not giving greater status than subgenus to *Pronopes*", I have nevertheless decided that *Erodiorhynchus* Macquart should be accorded full generic status once more. This is not simply to avoid the nomenclatural difficulty, but because I am convinced the change is justified on all grounds, and by bringing it about now a certain amount of name changing from *Mesomyia* to *Eriodorhynchus* and back again can be prevented.

The *Erodiorhynchus* species seem to form a small but distinct group. They are bee-like, shiny, with long hairs, and usually well covered with pollen.

Mesomyia (Perisilvius) tinleyi n.sp.

A large, dark *Mesomyia* with a strong but superficial resemblance to *Amanella medialis* Oldroyd (fig. 4, *d*). It is closely related to *Mesomyia marieps* n.sp., in fact it is just possible that they are only subspecies; however they are not geographically close, and inhabit differest forest types.

The basic colour is dark black-brown with a light, pearly pattern of striped mesonotum, light scutellum and large, bold median abdominal triangles. The wings are darkened, paler in the central area, but with the veins infuscated, and the cross-veins clouded. The palpi are broad, blade-like and greatly flattened, with an elongate, hairless central region. It differs from *marieps* in being larger, darker, and in having more extensive adominal triangles which are pearly greyish-white and not yellow. The frons is longer, narrower and nearly parallel, not slightly divergent. Also the wings which are more rounded apically, are darkened with only the central region pale, as well has having the veins infuscated, whereas in *marieps* only the veins are infuscated and the cross-veins spotted.

In the key to the species of the subgenus *Perisilvius* (Oldroyd, 1957, p. 214) this species runs down to *mossambicensis* Santos Dias; however *tinleyi* is very much larger with a bolder, more conspicuous pattern and darker wings. The palpi are also more exaggerated in shape.

Head: ♀. Eyes very sparsely and very minutely haired. Frons (fig. 4, *f*) longer than in related species, and narrower; tomentum fawn, uniform in colour from lower eye angles to vertex and over well-developed ocellar tubercle; ocelli pale golden; hairs short and pale, at vertex only. Callus situated on distinct ridge running full length of frons, elongate, narrow, medium yellow-brown, in holotype does not reach ocellar tubercle. Subcallus entirely but thinly tomented, easily rubbed; colour of tomentum dark brown, distinct from that of frons; no hairs. Face similar but slightly greyish on upper margin; a few dark hairs, mostly on the upper third. Parafacials and buccae with paler, greyer tomentum, grading to yellowish along eye margins; hairs short black, becoming long on lower parafacials and buccae. Palpi: 1st segment dark grey with long black hairs; 2nd broad and blade-like, so much flattened as to be translucent centrally; dark brown, blackish apically, with large, elongate, hairless central area reddish, short black hairs only around edges. Proboscis almost entirely black, diffusely reddish in parts. Antennae: (fig. 4, *e*) 1st segment broader apically than at base, longer than 2nd, greyish-yellow with short black hairs; 2nd very short, yellow-brown with short black hairs; 3rd orange-brown becoming infuscated after basal third; terminal segments darker, but not black.

Thorax dark brown with moderately distinct whitish pattern. Median stripe evanescent; sublaterals tapering after transverse suture to reappear as indistinct prescutellar crescents; supra-alars diffuse; lateral borders pale; humeral lobe almost white; notopleural lobes whitish above with long pale hairs, browner below with long dark hairs. Scutellum almost entirely covered with whitish-grey tomentum, slightly browner basally, hairs long, pale, shining and numerous. Pleura mostly brown, becoming greyish posteriorly, especially ashy on upper posterior angle of mesopleuron and in hypopleuron; hairs mostly long, dark, but shining, long, pale on light mesopleural patch.

Abdomen dorsally very dark brown with large, pearly median triangles prominent on tergites 2-5 (whitish tomentum over orange-brown ground colour results in a pearly, pinkish-grey-white); whitish hind margins expand into indefinite lateral triangles on tergites 1-3, thereafter hind margins becoming less distinct and not expanded; median triangle on sixth tergite smaller, less bright; ultimate tergite yellow-brown and virtually unpatterned. Ventrally dark brown, some thin whitish tomentum on first and basally on second sternites; white hind margins becoming less distinct apically; ultimate sternite uniformly brown. Hairs predominantly pale on first sternite, otherwise concolorous.

Legs: Coxae like pleura, hairs mostly long, dark, a few long pale. Femora black-brown, yellowish narrowly at apex, hind femora slightly more reddish. Tibiae nearly as dark, slightly more reddish-brown. Tarsi very dark, nearly black. Hairs on femora, tibiae and tarsi dark.

Wings smoky brown along fore and hind margins, and at apex, centrally yellower with dark colour concentrated along veins; pale centres to 1st and 2nd submarginal cells, and marginal cell hyaline basad of very dense dark stigma. Squamae dark brown. Stalk of halteres yellow-brown, darker apically; knob dark brown tinged reddish on outer surface.

Length: Length without antennae 14·5 mm., wing length 12·0 mm. Frons index 3·71.

Holotype in the Natal Museum.

Distribution: Known to me only on the type specimen, from the Gwalaweni Forest, Lebombo Mountains, Zululand, 13.XII.63. A note by the collector, Mr. K. Tinley, reads "Biting man at dusk".

Mesomyia (Perisilvius) marieps n.sp.

This species is obviously very closely related to *M.tinleyi* n.sp., but there are certain differences which I think cannot be accounted for by intraspecific variation. Unfortunately both species are represented by uniques. However in both specimens the pattern is well preserved, though *marieps* has a cracked abdomen and is missing several legs (fig. 4, *a*).

The type of *marieps* is a much older specimen which may possibly have faded. It is a deep sepia-brown as compared with the black-brown of *tinleyi*, the light markings are

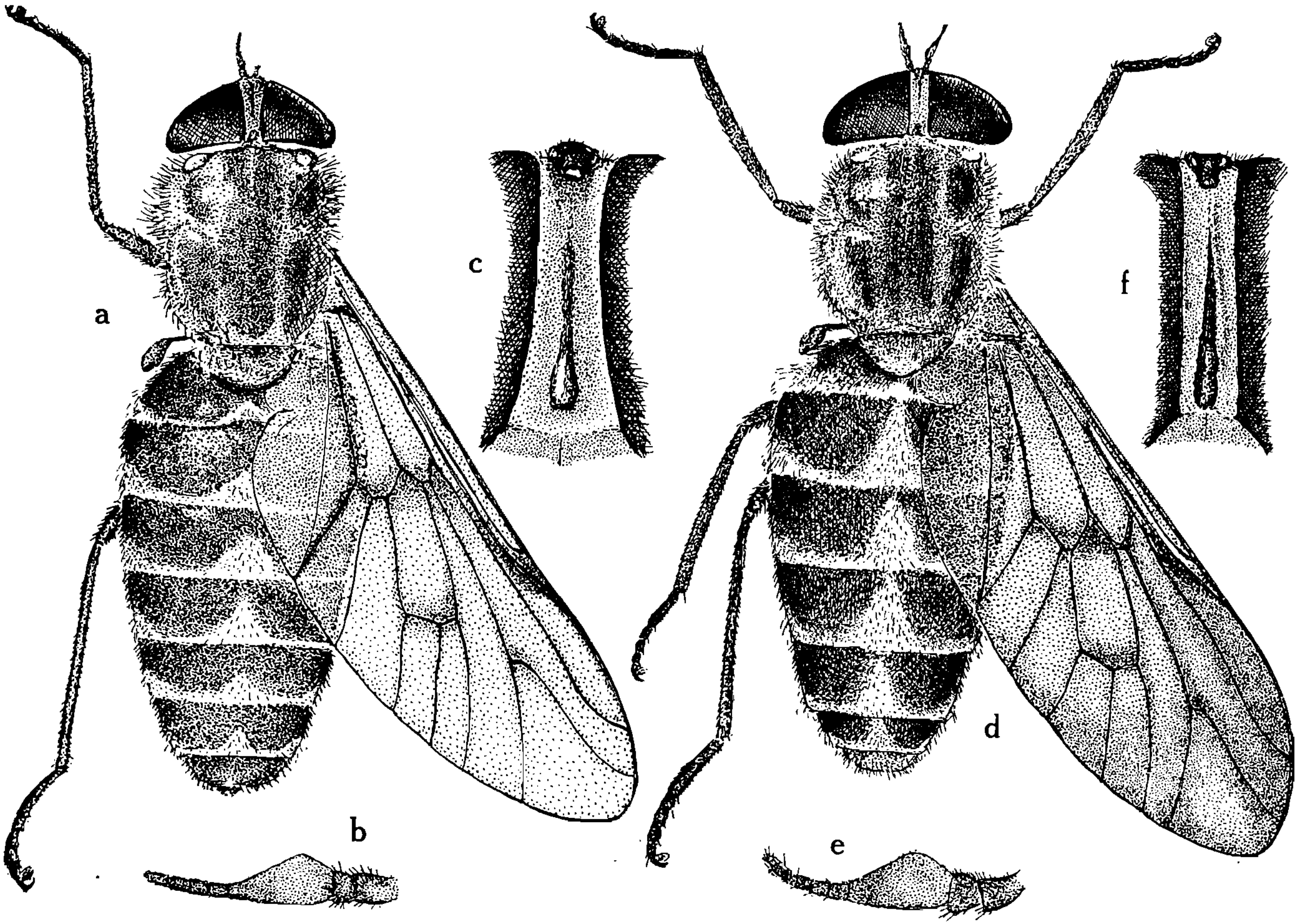

Fig. 4. *Mesomyia marieps* n.sp. (*a*) Holotype, (*b*) antenna, (*c*) frons; *Mesomyia tinleyi* n.sp. (*d*) holotype, (*e*) antenna, (*f*) frons.

pale yellowish instead of greyish; the wing veins are infuscated with spotting on the cross-veins especially noticeable, but there is no conspicuous dark staining of the membrane along the wing edges and extensively at the apex, although the whole membrane does not appear to be absolutely colourless. The frons in *marieps* is shorter, slightly but definitely divergent towards the antennae, and the callus is not situated on a ridge, and the subcallus is more swollen. In general appearance *marieps* is a large, dark, sepia-brown and yellow *Mesomyia*, slightly smaller than *tinleyi.*

Head ♀. Eyes virtually bare, hairs very sparse and minute. Frons (fig. 4, *c*) long and narrow, less so than *tinleyi*, slightly divergent towards antennae; tomentum silvery along eye margins, elsewhere fawn. Ocellar tubercle well developed with three clearly functional pale amber ocelli; postoccipital fringe pale, short; hairs on frons moderately long, black, proclinate. Lower callus small, raised, conical; upper callus connected to lower callus, only slightly raised basally, flat above, elongate, narrow, not well defined, not reaching ocellar tubercle, clear, light yellow-brown. Subcallus definitely swollen, entirely covered with darker brown tomentum contrasting with paler frons, without hairs. Face similarly coloured, less densely tomented, slightly greyish in upper angles, with a few inconspicuous dark hairs. Parafacials and buccae similarly brown, parafacial edge of tentorial pits with greyish tinge; striking silvery border along lower eye margins; hairs dark brown, long but not dense on lower buccae. First palpal segment dark with greyish tomentum; hairs long, not very numerous, dark, slightly paler and longer below. Second segment long, curved, approaching blade-like, shaped as in figure, but neither as broad nor as flattened as in *tinleyi*, the bare patch also not as extensive; hairs short, black; similar in colour to first segment, but slightly more reddish on bare patch. Proboscis dark, black-brown, with slight reddish tinge. Antennae (fig. 4, *b*): first antennal segment slightly broadened apically, longer than second, reddish in ground colour, but appearing yellowish-grey, because of paler greyish tomentum, hairs short and black; second segment similar to first in colour, with longer hairs; third with slight dorsal angle, rather short, brownish-orange basally, becoming slightly more brown apically; terminal segments the same brown, not darker.

Thorax reddish-brown with moderately distinct greyish pattern. Median stripe evanescent, sublaterals reaching transverse suture and enlarging slightly to indefinitely lozenge-shaped spots; prescutellar crescents moderately well defined; edges of mesonotum greyish-white, only lower edge of notopleural lobe brownish, humeral calli yellowish-white, supra-alars diffuse, greyish. Hairs mostly long, dark, semi-recumbent, with a few light ones especially anteriorly; long, shining silvery-white on pale borders of mesonotum except on lower part of notopleural lobes where they are longer, thicker, dark and bristling. Pleura mostly brown, diffusely greyer posteriorly; tomentum brown, but pinkish-brown on sterno-ptero- and hypo-pleura; hairs dark brown, paler posteriorly, but still brown except just under squamae where they are whitish yellow.

Abdomen dark sepia above, with distinct pattern of equally sized median triangles, and hind margins expanded laterally, which appear yellowish to the naked eye, but are greyish-white under a microscope; triangles distinct on tergites 2-4, very small on first, indistinct on 5th; evanescent on 6th, absent on 7th. Hairs short and dark except on light areas where they are mostly shining silvery. Venter sepia-brown, slightly lighter than dorsum, with grey-white hind margins broadest on second sternite, becoming narrower posteriorly; first sternite greyish-brown with some yellow diffusion, without pale hind margin or hairs; hairs elsewhere dark on brown areas, shining silvery on hind margins.

Legs (only three present, middle legs absent). Fore coxae like pleura, with mostly long, dark hairs, but some long, pale silvery ones laterally; otherwise legs almost uniformly reddish-brown, entirely with black hairs; fore tarsus slightly darker brown.

Wings: Membrane not entirely colourless, slightly smoky; veins infuscated, colouring most pronounced at cross-veins. Squamae brown, edge of membrane connecting upper and lower squamae with conspicuous tuft of shining white hairs. Halteres with yellowish-brown stalk, and knob reddish-brown, darker basally.

Holotype ♀ in the Transvaal Museum.

Distribution: Known only from the holotype, collected by G. van Son on Marieps Mountain, Drakensberg Escarpment, Eastern Transvaal, January 1926.

Genus *Tabanocella* Enderlein

Tabanocella schofieldi n.sp.

In the key to the species of *Tabanocella* (Oldroyd, 1957, p. 167), this species runs down to *denticornis* (Wiedemann) which it closely resembles in most respects. However the abdomen is more like that of *zoulouensis* (Ricardo). These species make a curious and closely related trio; *denticornis* is extremely variable but the other two appear to be much more constant. Because of the many similarities between these three species I have decided to discuss their colour patterns in some detail. The only other species of *Tabanocella* known to occur in Natal, *bilineata* Oldroyd, from Van Reenen in the Drakensberg, seems to be of the same general pattern, but the wing markings are very pale. I have never seen this species so will not refer to it further.

The abdomen of *denticornis* may be quite bright orange-brown or pale yellow-brown, uniform, or lighter (mainly centrally), on the first three tergites, with two bars on the second tergite (fig. 5, *g*); the bars may be reduced to uneven lines or be discontinuous elongate spots on the fore and hind margins of the tergite. The stripes, broad or narrow, may extend from the first to third tergites, and the apex may or may not be a deeper red-brown. The darkest forms of all I have seen only from Richmond District, the Karkloof Range and Town Bush Valley in Natal, and Ngome in Zululand; it has broad stripes extending the length of the abdomen, which are dense black-brown on the first three tergites and deep brown thereafter but are not always easily discerned because the apex of the abdomen is also dark brown, although usually less dense in colour; the first three tergites are almost always a translucent pale yellow, most noticeably centrally (fig. 5, *h*). The mesonotum also varies in colour from uniform yellowish-brown in the pale form to definite yellow and dark brown stripes, as in fig. 5, *a* (identical to *schofieldi*). The darkest form of all has an even more contrasting mesonotum, the dark stripes deep brown, and the lateral borders continuously and broadly dark, contrasting very sharply with the pale pleura. The palpi of the pale form are relatively light while those of the dark form are deep brown with many black hairs, like *schofieldi.* The callus is usually dark in the dark form and pale in the pale form but this is by no means constant. The colour of the scutellum seems to be in no way correlated with the different forms, some of the darkest have a pale scutellum and some of the palest an altogether dark one. Presumably the darkest variety in Natal is the form *natalensis* (Oldroyd, 1957, p. 175), and the typical form would be the pale form with bars on the second or first to third tergites, but defining the limits is virtually impossible.

The mesonotum in the specimens of *schofieldi* so far known is very much less variable than in those of *denticornis*, with the stripes differing only slightly in intensity of colour, always present but never as dark as the darkest *denticornis.* The abdomen is also much more constant, the stripes on the second tergite may be thin or thick, almost straight or uneven, and those on the third tergite may or may not reach the anterior margin of the segment (fig. 5, *a* and *b*). All the other tergites, except possibly the fourth, have black-brown hind margins (the same colour as the pattern on the preceeding tergites); I have seen only slightly darkened hind margins on *zoulouensis* and *denticornis.*

There are only three *zoulouensis* females in the collection of the Natal Museum and five males; except for two males which have a plain thorax and veryfaint abdominal pattern, they are all nearly uniform (fig. 5, *f*).

The most widely spread of the three species is *denticornis*, and as Oldroyd says, "the form *natalensis* seems to be centred in Natal and in the eastern Cape Province". Those specimens which I have seen from further south and north in Rhodesia have all been of the pale typical form. Also fairly widespread is *zoulouensis*, from Natal (Town Bush Valley), Swaziland, many localities in Zululand, and Rhodesia (Mt. Selinda). The only place *schofieldi* is known to occur is in the riverine forest at the mouth of the Tugela River, Zululand; it may prove to be more widespread, but it has not yet been found elsewhere despite searching by Mr. K. Tinley and Mr. T. Schofield.

To compare these three (fig. 5 *a*, *b*, *f*, *g*, *h*), the abdominal pattern of *zoulouensis* and *schofieldi* is very similar, but *zoulouensis* has more extensive black markings basally and the longitudinal bars are linked at least across the hind margins of the second and third tergites. The subsequent hind margins of the tergites of *zoulouensis* are not a definite black-brown as in *schofieldi* even when they are slightly darkened. The palest *denticornis* is quite unique in this group, with the pattern limited to the second tergite, but the basal tergites may be translucent. The medium dark form is the most like the other two species both in colouring and pattern, but the longitudinal bars are never linked across the hind margins; the basal tergites may or may not be translucent and there may be some diffuse darkening above the lower facial margin. The darkest form always seems to have this darkening, but not formed into a rectangle, and the general appearance of the abdomen is blacker than either *zoulouensis* or *schofieldi.* The face of *zoulouensis* is usually altogether pale but may be faintly tinged darker at lower margin, the palpi are not as dark as *schofieldi* or the darkest *denticornis*, but darker than the pale *denticornis;* however the shape is very uniform throughout as is also the shape of the antennae. The wings of *schofieldi* and *denticornis* are virtually identical, but the pattern of *zoulouensis* is much more abbreviated.

An adequate analysis of the frons measurements of the three species is unfortunately not possible, although there are very many *denticornis* and a moderate number of *schofieldi*, the sample of *zoulouensis* is far too small. The means, standard error of the means, and coefficients of variation of the frons index of the first two species are tabulated with the mean and range for *zoulouensis*.

The measurements used are:—

(*a*) $\text{length of frons} \; \frac{\text{frons width at vertex} + \text{frons width at callus base}}{2}$

called here the frons index.

(*b*) $\frac{\text{frons width at callus base}}{\text{frons width at vertex}}$

called here the index of frontal divergence.

a. *Frons index*

	N	Standard error	±2 x S.E.	±3 x S.E.	Coefficient of variation	Range	Mean
schofieldi	12	·041	3·352— 3·185	3·393— 3·147	4·23	3·00— 3·50	3·27
denticornis f.typ. . .	24	·034	2·808— 2·672	2·842— 2·642	6·16	2·49— 3·12	2·74
denticornis f.*natalensis*. .	15	·041	3·092— 2·928	3·133— 2·897	5·09	2·75— 3·33	3·01
denticornis f.typ. + f. *natalensis*	39	·031	2·909— 2·773	2·943— 2·739	7·38	2·49— 3·33	2·84
zoulouensis	3	—	—	—	—	2·30— 2·78	2·52

b. *Index of frontal divergence*

	denticornis	typical form	form *natalensis*
Range	1·68—1·30	1·66—1·30	1·68—1·41
Arithmetic Mean	1·53	1·49	1·60
	zoulouensis		*schofieldi*
Range	1·42—1·31		1·67—1·40
Arithmetic Mean	1·38		1·52

Separating the two forms of *denticornis* has been very arbitrary because no real division exists, so I have taken measurements over the whole colour range first and then separated the specimens into those with distinctly darkened abdomen (apically at least) and those with uniformly orange-brown abdomens, regardless of whether the pattern is on one or three tergites.

There is an overlapping in the ranges, *zoulouensis* with the lower and *schofieldi* with the upper end of the range of *denticornis*, although the extremes in both cases lie outside the range. The range of the frontal divergence of *denticornis* covers the ranges of the other species, and the overall mean is very close to that of *schofieldi*. From these figures it appears

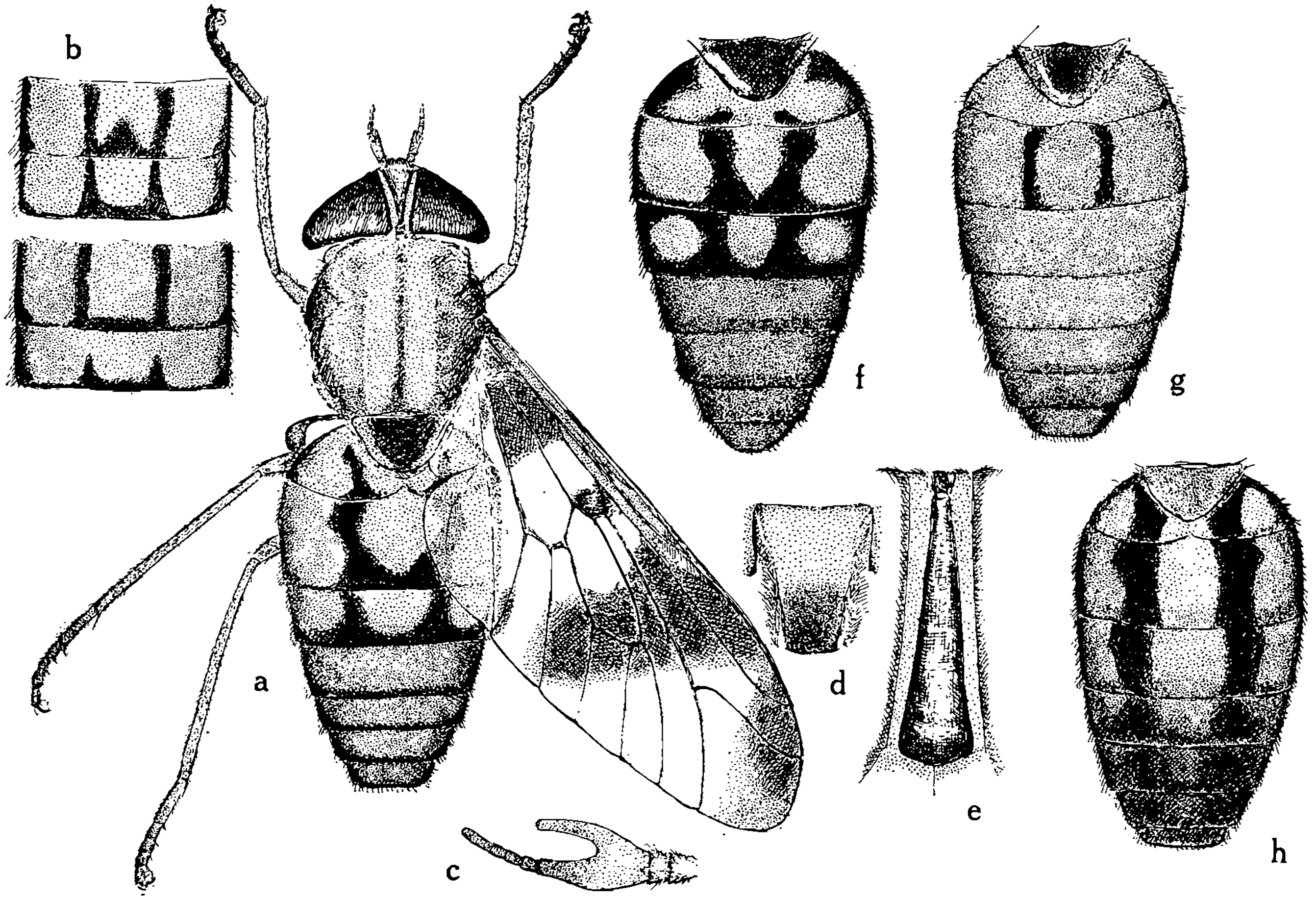

Fig. 5. *Tabanocella schofieldi* n.sp. (*a*) Female, (*b*) two variations in abdominal pattern, (*c*) antenna, (*d*) face, (*e*) frons; *Tabanocella zoulouensis* (Ricardo) (*f*) abdomen; *Tabanocella denticornis* (Wiedemann) f.typ. (*g*) abdomen, f.*natalensis* Oldroyd (*h*) abdomen.

that *zoulouensis* has the shortest, least diverging frons, *schofieldi* the longest, most diverging frons, and *denticornis*, a very variable species, spans the difference between them. It also appears that darker forms of *denticornis* have a slightly longer, more diverging frons than the paler forms. Finally, it is obvious that neither the frons index nor the index of frontal divergence of a single specimen can be used as a definitive characteristic.

I think it would be as well to draw attention to discrepancies in the illustration of *zoulouensis* in Oldroyd (1957, p. 172, fig. 93). On p. 171 the description is given as "Black-brown pattern as follows: first three segments have a pair of irregular sublateral stripes...", but in the illustration there are stripes on only the first two tergites. Also in the original description by Ricardo mention is made of how the longitudinal dark bars are united anteriorly and posteriorly with the dark lateral borders, on the third tergite, leaving a light, round, sublateral spot. The illustration does not show this, but it does show the hind margins of all the other tergites to be intensely dark, a condition I can find no mention of either in the original or in Oldroyd's description, nor is it to be found in any specimen I have yet seen. Also the wing in the illustration is rather misleading, with more darkening along the anterior border and with a wider cross-band than is to be expected in *zoulouensis*, and it would be wise to refer to Oldroyd's photograph, Plate XI, fig. 5, when identifying the species. There is a certain similarity between the illustration and my own of *schofieldi*.

Description of *Tabanocella schofieldi* n.sp. (fig. 5, *a*)

Head ♀. Eyes bare, black in dried specimen. Frons elongate (fig. 5, *e*), narrow slightly divergent towards antennae, divergence accentuated by pronounced, highly shining triangular callus, extending from border of subcallus to black ocellar tubercle which has three ocelli. Callus generally light yellow centrally and orange-brown or dark brown narrowly at edges and extensively at base, sometimes entirely dark brown; in profile raised and bulging noticeably just above subcallus. Subcallus slightly swollen in profile, sometimes slightly shining (may be due to rubbing), tomentum pale brownish-yellow. Parafacials and buccae with same coloured tomentum, hairs only on lower edge of occiput and on the lower buccae, short and pale on the latter, becoming longer and more numerous but still pale on the former. Face bulging abruptly beneath antennae then with a flattened, slightly concave area, the lower two thirds of which is occupied by brown tomentum in a rather poorly defined, irregularly rectangular mark (fig. 5, *d*). Palpi: first segment small, pale, creamy-yellow, with a few pale hairs; second segment elongate, slender, yellow-brown but appearing very dark on account of numerous short black hairs. Antennae: (fig. 5, *c*) first segment irregularly triangular in outline, about twice length of second, both pale whitish-yellow, short black hairs mostly at apices; third segment with long curving dorsal tooth, and together with terminal segments, is yellow-brown or greyish-yellow, with small black hairs at joints and apex of dorsal tooth. Exact shape varies considerably between specimens.

Thorax: Mesonotum brown and greyish-yellow in longitudinal stripes, and thin, yellow-grey covering of pollen. Median line narrowest anteriorly, becoming progressively wider (not always conspicuously), reaching scutellum, dark or reddish brown in colour. Laterad of median stripe are broad, pale yellowish longitudinal bands which are, in turn, bounded laterally by broad dark bands; the colour fades to yellowish again before dark lateral margins. Hairs short, pale yellow, recumbent, and short stout, erect; black ones especially numerous and bristling on dark notopleural lobes. Scutellum dark brown over most of disc, pale yellow in lateral triangles which extend back as pale borders towards hind margin; apex of scutellum may be dark brown or narrowly yellowish; hairs concolorous. Pleura uniformly creamy-white, sharply divided from mesonotum by dark brown lateral band extending from humeral lobe to wing base. Hairs pale, almost white, especially numerous along upper hind margins of mesopleuron, and in tuft on metapleuron.

Abdomen (fig. 5 *a*, *b*): First two tergites pale, usually translucent yellow centrally, shading to orange-brown laterally, third tergite becoming more reddish. Dark black-brown pattern as follows: first tergite, lateral borders and two short longitudinal bars, but hind margin pale; second, lateral border pronounced, longitudinal bars may be thick or thin, almost always irregular in outline, may expand posteriorly on inward edge to unite at hind margin, or may be linked by broad or narrow bar which may be straight or may be steeply extended and broadened centrally, hind margin pale between lateral border and main pattern; third tergite with lateral borders well defined, longitudinal bars may reach anterior margin of tergite or narrow bar, hind margin laterally is narrowly dark linking main pattern with lateral borders. From fourth tergite onwards abdomen becoming progressively darker reddish brown, with dark lateral borders, and hind margins usually black-brown, often thinly laterally and more broadly towards the middle, but black-brown may be absent altogether on fourth tergite. Dark lateral borders, which always extend full length of the abdomen in all available specimens, expand laterally at each hind margin to give a serrated appearance to the stripe. Venter sharply separated in colour from dorsum by this dark stripe. Hairs on dorsum centrally pale, elsewhere dark, especially long on lateral borders. Venter without pattern, yellowish-grey becoming browner apically but colour depends largely on abdominal contents; hairs short, pale.

Legs: Coxae pale like pleura, basally with long pale hairs, becoming yellower apically with short dark hairs. Femora and tibiae brownish-yellow with mostly short black hairs and some longer pale ones. Fore tarsi brown, shading to black apically, hairs dark on top, light orange below; remaining tarsal segments almost black with black hairs. Mid and hind tarsi pale at base and reddish or brown at apex, remaining segments dark brown; hairs black above and reddish-orange below.

Wings very like those of *denticornis*, with rather broad central band and darkening along costal border, see fig. 5 *a*. Squamae dark brown. Haltere stalk yellow basally, black-brown apically, knob black-brown.

Distribution: Known only from the Tugela River Mouth so far. Here *schofieldi* occurs in tall, well developed coastal forest growing on sand, and is sympatric with *denticornis.* Mr. Schofield has said that it was very common, flying round his car, in March, but when my husband and myself were there in December we saw few specimens. Apparently they are not attracted to humans.

Holotype ♀ and eleven ♀♀ paratypes in the Natal Museum. The holotype and six paratypes caught by Mr. T. Schofield in March 1963, 5 paratypes caught by Mr. B. Stuckenberg in December 1963, all at the Tugela River Mouth, Natal.

Key to *zoulouensis*, *denticornis* and *schofieldi*

A. Wings with narrower central band and less darkening along costal edge than in fig. 5, *a*, longitudinal bars on third tergite joined along fore and hind margins to dark lateral borders, leaving one translucent sublateral spot on each side .. .. **zoulouensis**

——Wings as in fig. 5*a* .. .. B

B. Abdomen with longitudinal bars linked across hind margins on second and third tergites, black-brown hind margins usually on all other tergites (may be absent on fourth); rectangular dark patch on lower margin of face .. .. **schofieldi**

——Abdomen plain, orange-brown or yellow-brown with two longitudinal stripes on second tergite, mesonotum plain or indistinctly marked; **or** abdomen with parallel longitudinal dark stripes on first to third tergites, not linked across hind margins; apex of abdomen may or may not be darkened; may have indistinct darkening on lower facial margin; mesonotum striped but not boldly; **or** abdomen with broad dark stripes running the full length (not linked across hind margins), but indistinct from fourth tergite onwards; apex of abdomen very dark; palpi black-brown; lower facial margin distinctly tinged brown but not in definite rectangle; .. .. **denticornis,** typical to *natalensis* forms

Genus *Tabanus* Linn.

Tabanus saxicolus n.sp.

This is a member of the *chevalieri* group, defined by Oldroyd (1954, p. 126) as having the "lower callus filling the lower end of the frons from eye to eye; upper callus linear. Vertex with a bare shining area." The eyes are hairy, but only minutely.

In Oldroyd's key to the species of the *chevalieri* group of *Tabanus*, this species comes out as *chevalieri* Surcouf, but it does not fit well because the bases of the palpi are definitely swollen, although they might not be interpreted as unusually so.

I have not seen *T.vexans* Loew, but from the description it would seem that the main differences are the black hind tibial fringes and the yellow abdominal pattern; in *saxicolus* these are pale and usually grey or sometimes yellowish-grey respectively.

Several details distinguish *saxicolus* from *chevalieri* and *maluba* Bequaert. The bases of the palpi are slightly but definitely more swollen and the mesonotal pattern less clearly defined in the former. The sublateral abdominal markings of *saxicolus* are definite spots, practically circular, not triangular or irregular. *T.chevalieri* is altogether a greyer, more hairy fly, and both it and *maluba* have many more long grey hairs dorsally on the thorax and abdomen. On the whole *saxicolus* is a larger, darker, more shining fly with clear-cut abdominal markings; it is definitely black-brown, with an ashy, almost silvery, pattern which is not yellowed in any way (fig. 6).

♀ *Head:* Eyes dark green in life, a deeper and less brilliant colour than in the male, without markings; hairs very short, numerous, yellowish. Frons (fig. 6) slightly but distinctly convergent towards antennae. Lower callus almost square, medium brown, but darker on dorsal margin, narrowly linked with dark, blackish-brown, lanceolate upper callus. Upper callus surrounded by black tomented patch, wider but also lanceolate, with conspicuous, stiff, black, proclinate hairs with forward curving tips. Small, narrow strips of reddish-brown tomentum between dark patch and eye margins. Above and below upper callus tomentum silvery-grey; at vertex bare patch large, roughly rectangular, sub-shining, deep reddish, almost chestnut. At lower edge of bare patch is situated pale yellow ocellar tubercle with vestigial ocelli, clearly non-functional. Hairs on silvery patches and reddish strips at eye margins almost erect with forward curved tips, shining, pale; also pale but fine and strongly proclinate above upper margin of lower callus. Hairs on bare patch at vertex mixed, pale and fine, and longer, strong, black, all with forward curved tips, some-

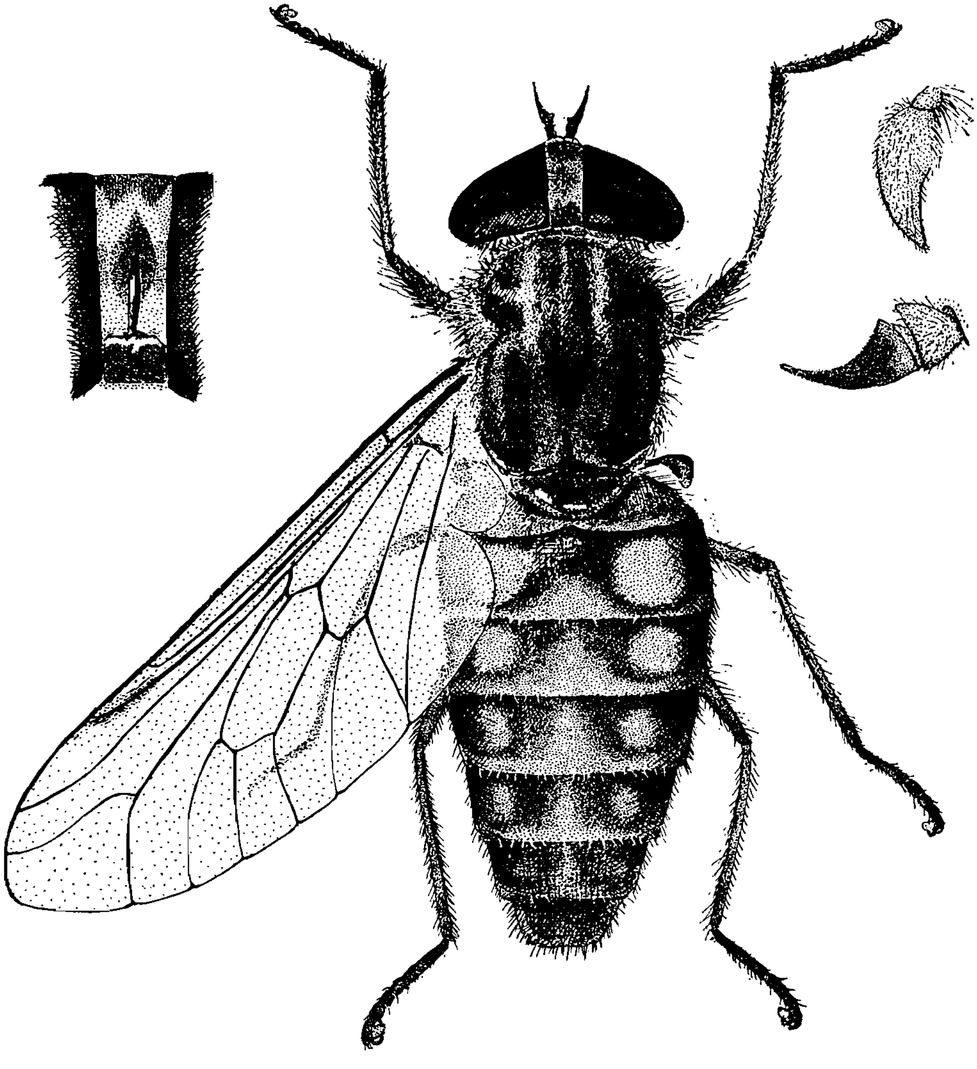

Fig. 6. *Tabanus saxicolus* n.sp. Holotype.

what proclinate, the black ones most noticeably curved except at border of vertex. Subcallus slightly swollen and easily rubbed, yellow-brown in ground colour with greyish-yellow tomentum. Parafacials and buccae slightly swollen, white; hairs very long and dense along lower occipital margin, a few black below parafacial angle, and below eye margins. Tomentum of face white, blending to yellow-orange at lower corners beneath tentorial pits; lower half of mesofacial area grey, where dark ground colour shows through thinner tomentum. Palpi: first segment mainly dark grey, narrowly yellowish apically, with long, fine, dull white hairs; second segment slightly swollen and tapering to a point, very pale yellow-orange, hairs mostly silvery-white, shorter than on first segment, with a few short black hairs. Antennae (fig. 6): first segment relatively large with upper angle overlapping small second segment, both with pale grey tomentum not completely obliterating dark ground colour; hairs short, stiff, black, most numerous on upper angle of first segment; third segment orange-brown basally only in narrow crescent, thereafter black; terminal segments black.

Thorax: Mesonotum subshining, dark blackish-brown with very thin, inconspicuous bronze-brown tomentum. Median stripe faint grey on anterior mesonotum only, subsequently apparent only in certain lights as a reddish-bronze line, not reaching scutellum in holotype. Sublateral stripes broad, grey, with abundant pale hairs before transverse suture, after which they fade to reappear as broad, rather indistinct, and yellow-brown, enlarging posteriorly until they almost meet at hind margin of mesonotum, leaving only narrow strip dark medially. Supra-alar stripes similarly yellowish with a little greyish tomentum, faint prescutellar crescents of same colour. Humeral lobe, notopleural lobe and lateral borders basically yellow-brown covered with whitish tomentum, therefore appearing pinkish-yellow. Hairs on mesonotum pale, reclinate, most numerous and conspicuous on anterior part of mesonotum, especially thick on grey parts of median and sublateral stripes, pale hairs also fairly numerous along supra-alar borders and on humeral lobe; hairs otherwise mostly black, sub-erect, fairly long and dark on postalar callus, long, black and bristling on notopleural lobe. Scutellum dark brown with some long black hairs, and pale, recumbent, fairly numerous ones along lateral and posterior borders. The pattern is largely due to lightening of the ground colour, and to tomentum only on the anterior mesonotum, therefore it is not at all conspicuous. Pleural ground colour yellow and dark brown, with whitish tomentum, which results in yellowish and grey patches; hairs white. Mesopleuron predominantly pale yellow-orange, grey horizontally on lower third; long thick tuft of pale yellowish-white hairs on posterior dorsal angle. Upper edge of sternopleuron with some yellow-orange colour, otherwise grey. Remainder of pleura greyish with slight diffusions of yellow. Long tufts of hair on lateral extension of postscutellum and pteropleuron.

Abdomen. Dorsum basically dark, blackish brown, with no reddish colour sublaterally. Pattern made up of pale yellow hind margins expanding laterally and continuing up lateral borders of tergites, median triangles and sublateral spots in pale grey. First tergite extensively grey at sides, dark centrally and above yellow hind margin median triangles and sublateral spots well defined, conspicuous on second tergite and after this becoming progressively smaller, very small and faint on 6th tergite, absent on 7th. Venter dark with

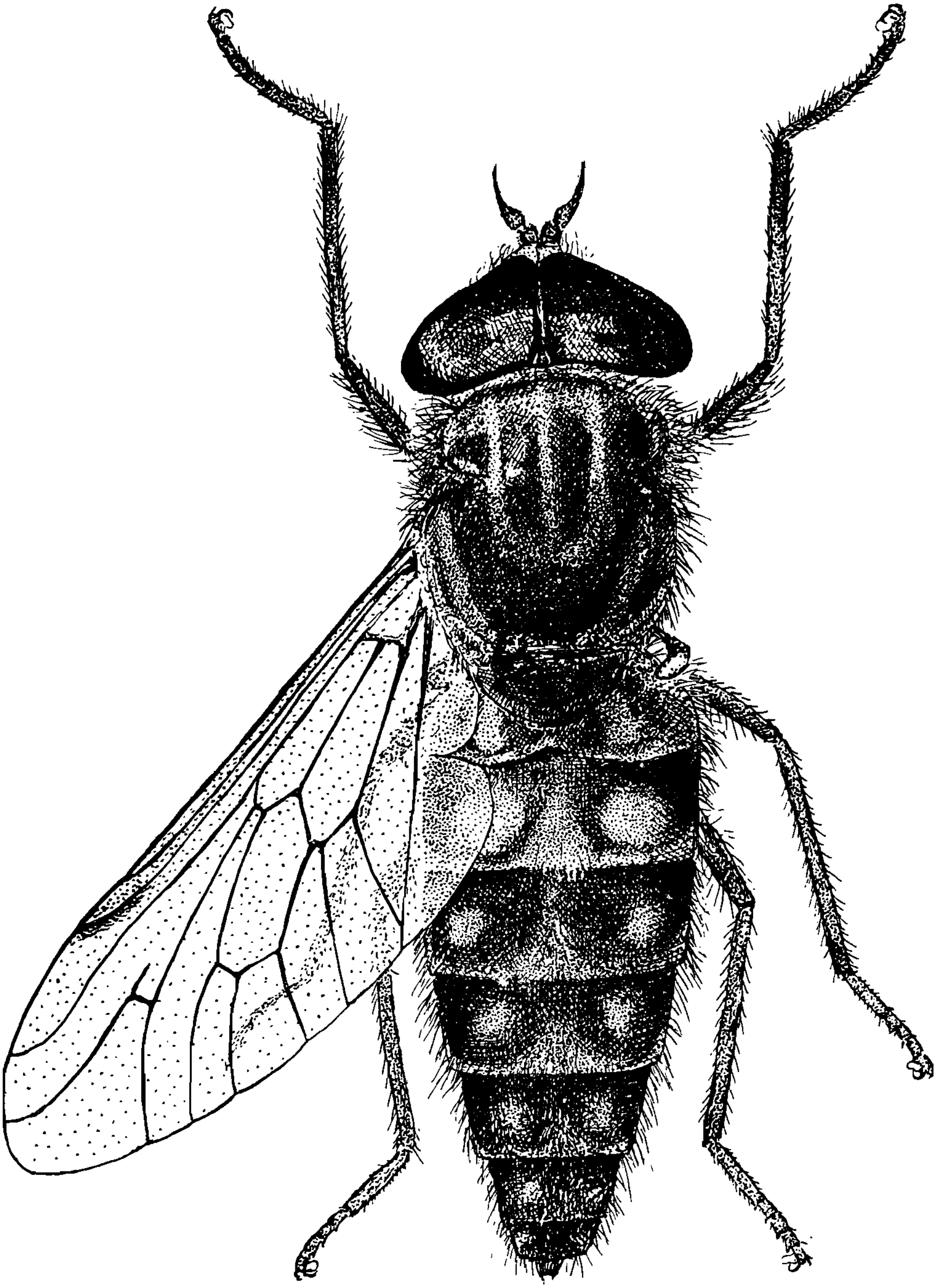

Fig. 7. *Tabanus saxicolus* n.sp. Male.

yellow hind margins, silvery-grey tomentum thickest laterally, making lateral quarter grey. Hairs mixed, pale shining and black.

Legs: Coxae grey, hairs especially long and white on fore coxae. Femora: fore femora dark grey on outer surface with long, dense white hairs; inner surface with very thin tomentum thus appearing dark blackish-brown, hairs recumbent black; mid femora yellowish-grey, hairs pale, long on lower hind surface and becoming erect at extreme base, dorsally; apex slightly more grey, especially on anterior surface, but no thinning of tomentum; hind femora also yellowish grey, darker grey at apices, long pale hairs sparser, longest on lower surface. Tibiae: fore tibiae light brownish-yellow, blackened broadly at apex, tomentum mainly light greyish yellow but dark on darkened apices, and thinner on inner surfaces; hairs predominantly long, pale on light areas with some dark, short intermixed ones; on dark areas, dark hairs with some long dark touch hairs at extreme apex; mid tibiae brownish yellow with only slight greying apically, hairs long, pale, very numerous; hind tibiae similar, with slightly dark apices, and long pale fringe of hairs below, on antero-dorsal and post-ventral surfaces. Fore tarsi darkest, virtually black, mid and hind blackish-brown, browner at base of first tarsal segment; hairs black.

Wings hyaline with no appendix to R_4. Squamae pale yellow-brown. Haltere with stalk yellowish, blending to brown at apex, knob with some yellow, otherwise brown.

♂ (fig. 7) very like the female in general appearance, but smaller, darker, with very little mesonotal pattern apparent, and with much smaller abdominal spots. All specimens have a distinct appendix to vein R_4, which is often long. This is noteworthy, as the unique holotype female has none at all.

Head: Eyes in life very brilliant, uniform, peacock green; hairs variable in quantity, as in female or else extremely sparse; eyes contiguous for most of the length of frons, ocellar tubercle small, without ocelli. Subcallus slightly inflated, tomentum thick, silvery grey becoming yellowish above bases of antennae. Antennae slightly shorter than in female, therefore appearing broader, but without important differences in shape; third segment with a very variable amount of orange basally, anything from a narrow strip to fully half the segment, sometimes remainder of third and all of terminal segments brownish, otherwise black. Face, parafacials and buccae grey with some long black hairs around eye margins and on adjacent parafacial area, elsewhere mostly pale, almost white. Palpi short, plump, yellowish, some black hairs apically on second segment, otherwise hairs white, very long on first segment.

Thorax: Mesonotum darker than in female, pattern even less well defined. Sublateral and median stripes conspicuously tomented only on anterior mesonotum, very narrow before transverse suture. After transverse suture sublaterals form inverted comma-shaped, incurving crescents of thin greyish or bronze-brown tomentum which link with bronze-brown median stripe about half-way between transverse suture and hind border of mesonotum. The pattern is not the same as in the female. There is only a slight lightening of ground colour where sublaterals should terminate, and this is not always present. Some grey tomentum borders the edges of mesonotum, but does not form prescutellar crescents; supra-alars very faint, greyish; humeral and notopleural lobes with thicker grey tomentum, darker than in female. Hairs more numerous, both dark and light, dark hairs very long, erect. Pleura much darker, blackish-grey, occasionally a little yellow, especially along sutures and around first spiracle. Hairs mostly white, some black particularly in mesonotal tuft.

Legs altogether darker than in female. Coxae as in female, sometimes darker. First femora almost black, underside bare and shining; second and third slightly paler, a deep blackish grey. First tibiae may be almost black or yellow-brown with darkened apices (a large amount of variation); second and third tibiae paler, brown or yellow-brown; hind tibial fringes less dense than in female, with a tendency to be arranged in four lines, hairs black, only lower ones sometimes white. Tarsi as in female.

Wings as in female except for distinct and often long appendix to R_4, and R_{2+3} definitely sinuous. Haltere knob more yellow, sometimes almost completely pale primrose.

*Abdomen:*Dorsum darker in appearance than female, with grey, sometimes yellowish, median triangles and sublateral spots varying a certain amount in size,smaller than female but still well defined. First tergite with definite small pale spots as well as grey antero-lateral borders. Venter usually darker, being brown, grey-brown or yellowish-brown with pale hind margins and light grey tomentum which may be thicker laterally like the female or more evenly distributed.

Measurements: ♀ Length without antennae 12·5 mm.; wing length 11·0 mm. Frons index 3·5. ♂ Length without antennae 10·0—10·5 mm.; wing length 7·5—8·5 mm.

Notes: T.saxicolus appears to be a member of a temperate assemblage of insects found in the Drakensberg Mountains in Spring. It has been caught only in September, in a stream-bed of a tributary of the upper Little Bushmans River, in the Giant's Castle Game Reserve (5,800ft.), Natal, and in the upper reaches of the Tugela River in the Royal Natal National Park. The rivers were very low in both cases and the flies have not been seen when the rivers were full. My husband first found several males sitting on sandstone boulders in a stream-bed in a patch of montane forest. These specimens were conspicuous on account of their glowing green eyes. Tabanid males are usually rare, and yet no females of this species could be found despite repeated searching for two years, until my husband caught one on a stone, in the upper Tugela River. There were many males also in the stream-bed, but this was the only female found. Presumably the females will be found in numbers around their host animals, but we saw none on cattle and horses near by, nor were we bitten. It has been a very perplexing fly.

Genus *Haematopota* Meigen

Haematopota mephista n.sp.

In Oldroyd's key to the species of the *tumidicornis* group (Oldroyd 1953, p. 155) this species runs down to *taciturna* Austen, being separated from the *ocellata-spectabilis-obscura* complex by the fewer and less conspicuous hairs on the eyes. Oldroyd has seen specimens of *mephista* and has said that it is distinct from *taciturna,* and the geographical separation is so great that synonymy does not seem likely; *taciturna* is from the Sudan and the Congo, an equatorial species, whereas *mephista* is known only from Natal.

H.mephista occurs in the same habitat as *obscura* Loew which it resembles in many respects. Both species occur together in Town Bush Valley and at the Karkloof; another undescribed species occurs in the Enon forest, Richmond District, Natal, which is relatively close, but unfortunately the unique specimen is lacking antennae and cannot be described. There are several other Natal localities from which *obscura* is known, including coastal scrub forest; all these localities are forested or at least heavily wooded, with indigenous trees or exotics (in the Karkloof both species occur in Black Wattle, *Acacia mellissima* Willd. plantations as well as natural forest). On sunny summer days at the Karkloof these two species as well as *Philoliche* (*Philoliche*) *aethiopica* (Thunberg), *Cydistomyia* (*Amanella*) *medialis* (Oldroyd), *Philoliche* (*Phara*) *bivirgulata* (Austen), *Tabanocella denticornis* (Wiedemann), and *Tabanus variabilis* Loew, have literally swarmed around the Natal Museum's Land Rover, being attracted to it from herds of most irritated cattle. At Town Bush Valley they also can be found attacking cattle, but *obscura* always heavily outnumbers *mephista*. The greatest concentration of *mephista* I have seen was under a dense canopy of trees where they were flying along an overgrown stream bed. The behaviour and appearance of *obscura* and *mephista* in the field is very different, and it is very easy to separate them in life; *mephista* is more furtive in its approach, and looks much blacker, while the bolder *obscura* looks quite grey. Under the microscope they look more alike, but all the specimens of *obscura* I have seen from Natal have a flat callus which is often black with some brown centrally, or entirely reddish-brown; they also have a parafacial band and a few brown spots instead of a solidly coloured area; round orange-brown facial spots instead of elongate, oblique, very dark ones, more pale markings on the thorax,

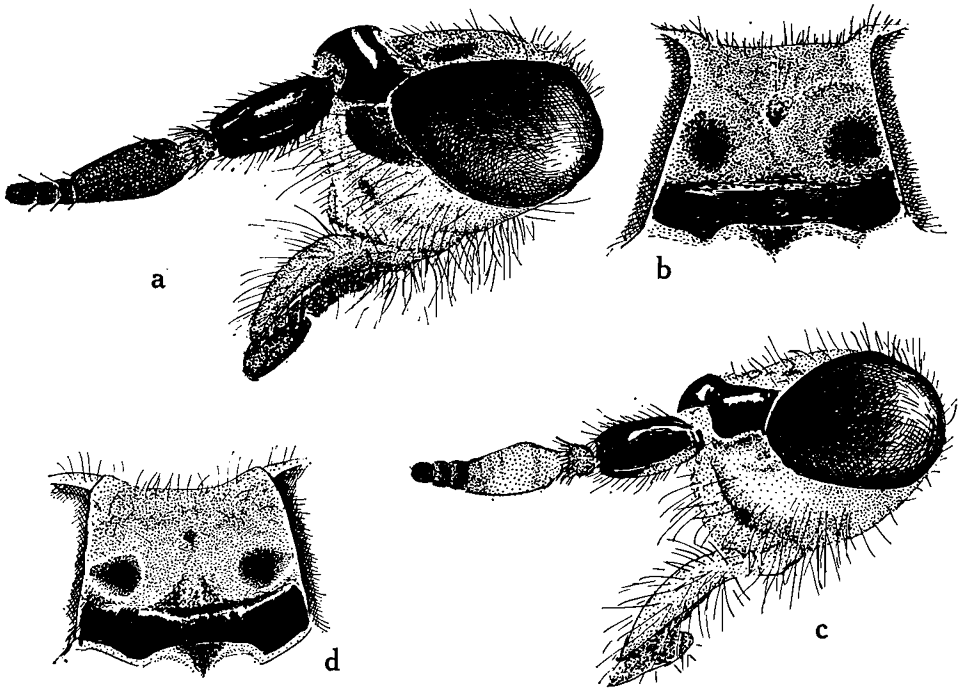

Fig. 8. *Haematopota mephista* n.sp. (*a*) Head, (*b*) frons. *H. megaera* n.sp., (*c*) Head, (*d*) Frons.

distinct pale hind margins to the tergites which have larger pale lateral spots, and larger more extensive pale wing markings.

This is an unusually dark *Haematopota*, almost black, with no conspicuous white markings. Thoracic markings faint, abdominal spots small, tibial rings 1 : 2 : 2. Microscopically the head is very striking with a shining jet-black, bulging callus, large paired velvety-black spots and generally with sparse tomentum giving the frons a blackish-grey appearance. Antennae also mostly black, the first segment bulbous and shining, and sometimes with an apical notch.

♀. *Head:* Eyes microscopically hairy, hairs sparse, pale, not noticeable. Frons (fig. 8, *b*) diverging towards antennae, index 1.1; black in ground colour with sparse brown tomentum which is easily rubbed, especially at vertical V which is often subshining black; it is divided by a faint grey-brown stripe running from median spot at vertex. Paired spots large to medium sized, round or flask-shaped, touching both eye and callus margins, or separated by a fine rim of tomentum. Median spot may be small or relatively large; usually with fine grey border to eye margins and frontal spots. Callus medium high, transverse, touching eye margins, indented at point of contact with paired spots, and sometimes with median extension which may be due to rubbing. Callus bulging out over bases of antennae, shining jet black except in centre where there is usually a brown spot, occasionally entirely brown. Sub-callus light brown with large black median mark. Parafacials divided, matt black patch extending from eye margins across parafacials and up to callus (in oblique lighting parafacial band remains black but area above has shining copper-brown sheen), remainder silvery-white with a very narrow strip extending up to callus, cutting parafacial patch off from a silver-white face; eyes and callus also have silvery borders. Facial spots black, indefinitely oval, steeply oblique, in rough chevron, but not as distinct as in *albihirta* Karsch. Hairs mostly dark on parafacials, but white on face and lower occiput. Palpi greyish-black, second segment long and pointed, somewhat swollen basally; hairs long and dark except a few white basally on first segment. Antennae (fig. 8, *a*): first segment usually bulbous, black, shining brilliantly, a little brown tomentum at the base of inner surface, but sometimes more slender, although still swollen, with dorsal apical notch, long black hairs; second segment short, tomented, dull black, hairs short black and bristly; third segment moderately long, without conspicuous dorsal angle but sometimes slight notch, dark, dull black-brown, with a few black hairs; terminal segments entirely black.

Thorax: Mesonotum dull black-brown, narrow median and sublateral stripes terminating at transverse suture, the latter with small, definite white triangles behind suture. Humeral lobes and supra-alar spots grey, prescutellar patch and crescents absent. Scutellum black-brown with only small, grey spots at extreme apex and basi-lateral edges. Pleural tomentum pale grey with diffuse brown patches; hairs long white with some long brown on mesopleuron.

Abdomen: Dorsum black-brown, very narrow grey hind margins, small sublateral spots and lateral borders which are particularly broad on first and second tergites. No median line. Venter blackish-brown with grey lateral borders and paired, diffuse, pale sublateral spots.

Legs: Fore coxae pale grey on basal two thirds with brown apices, hairs concolorous.

Fore femora brown with black hairs and thin grey tomentum; middle and hind femora somewhat more yellowish except at apices which are dark, grey tomentum especially noticeable at outer base and along inner surfaces. Tibiae almost black with black hairs, rings 1 : 2 : 2. Tarsi black with mid and hind basi-tarsi basally pale and remaining segments of these tarsi usually narrowly pale at joints.

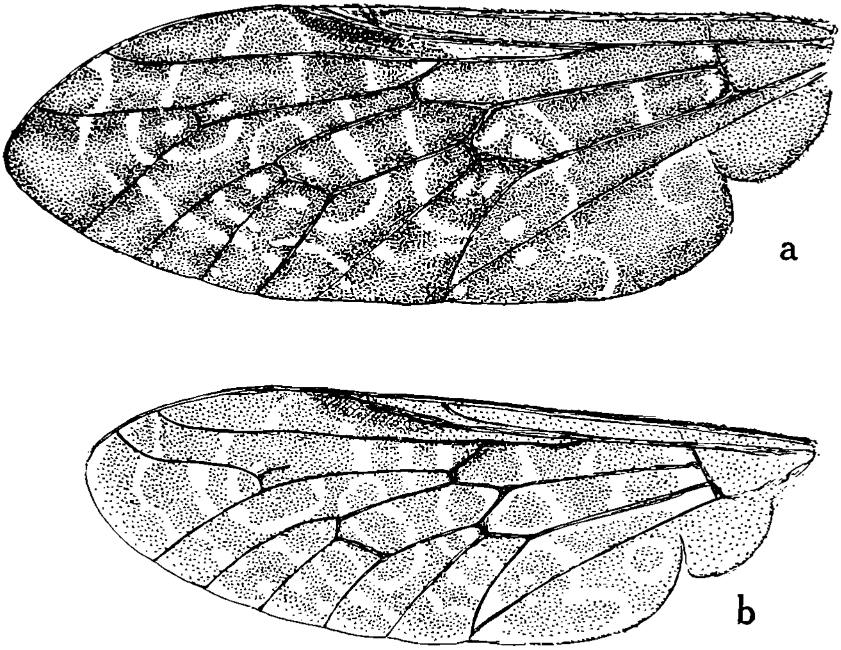

Fig. 9. *Haematopota mephista* n.sp. (*a*) Wing. *H. megaera* n.sp., (*b*) Wing.

Wings (fig. 9, *a*): Membrane very dark brown, silvery simple rosettes reduced, sharply defined; short but distinct appendix to R_4. Rosettes vary in extent and positioning to some degree, but in no important or confusing way in the known specimens. Halteres pale yellow stalk, knob very dark brown.

♂. Very like the female, but narrower, also very dark.

Head: Eyes very large, much wider than thorax, nearly twice as wide as the mesonotum immediately behind the head; colour, browner than the female in dried specimen; hairs short, pale, fairly numerous, contiguous for about three-quarters of the length, frons small with silvery tomentum. Subcallus black, subshining with large black velvety median spot and narrow brown rims above antennae. Parafacials and buccae somewhat swollen, with silvery-grey tomentum, parafacial patch not completely black, made up of black-brown spots around bases of long dark hairs, mostly connected by brown tomentum to give a splotchy appearance, extreme upper angle completely black; diffuse, pale brown spot on lower parafacials; hairs long, dark on upper parafacials, parafacial band and along eye margin; long pale brown on diffuse brown spot, elsewhere long, shining white. Face silvery-white, with paired, elongate, narrow, almost vertical dark brown spots (narrower than in female, almost lines rather than spots), hairs long, silvery-white. Antennae as in female, but shorter, especially the third and terminal segments, hairs longer and more numerous but colouring the same. Palpi shorter, plumper, greyish-brown with many very long upstanding hairs curved at the tip, white mostly on first segment and at base of second, stiffer, shorter and black at apex of second. Proboscis black.

Thorax: Mesonotum black brown with more and longer hairs than the female, hairs mostly dark; pattern less well-defined. Pleura darker than female, tomentum grey with extensive, diffuse dark brown patches. Hairs mostly long, white with a few dark on mesopleuron.

Abdomen: Even darker than female, and a more uniform black-brown. Silvery spots small and very clearly defined, white hairs very noticeable laterally, an especially thick tuft on posterior lateral angles of tergites. Venter as in female, pattern of tomentum in median dark brown band, grey lateral stripes on which are small, paired, diffuse brown spots on each sternite.

Legs with the colour distribution as in female, but altogether darker.

Wings as in female.

Distribution: caught at the Karkloof, in upper montane forest and black wattle plantations at 1500 m. and in the lower, degraded, montane forest at Town Bush Valley at 1000 m. in the summer months, November to January, after good rains had fallen. The male was caught by Mr. B. R. Stuckenberg on a leaf overhanging a stream bed in the forest.

Holotype ♀ in the Natal Museum, Town Bush Valley, Pietermaritzburg, Natal, December 1961. Paratypes: 8 ♀♀ and one ♂, from Town Bush Valley and the Karkloof Range, Natal.

Haematopota megaera n.sp.

This is a small, rather nondescript, dark-brown *Haematopota* with a brilliantly shining, jet-black or deep brown, jutting callus, and a similarly coloured, shining first antennal segment which is fairly short but distinctly bulbous. The palpi reach the tip of the proboscis and are slightly swollen basally. The wing markings are clearly defined, the pale rosettes are simple, not ocellate. The legs are not dark, and the femora are brownish-yellow. The orange-brown third antennal segment is conspicuous for being the only bit of bright colour on this drab fly. Most characteristic are the shape and colour of the callus and antennae. The antennae are rather short, especially the thick, black terminal segments, and usually their black-orange-black colouring is bright and contrasting.

This species is a member of the *tumidicornis* group. In some respects, especially the jutting callus, it resembles the larger, darker *mephista* n.sp., but this is a coincidence and there is no chance of confusing these species as they are also widely separated both geographically and ecologically. The interrelationships within the *tumidicornis* and *vittata* groups are not clear at present, and it would be pointless to make any assumptions as far as *megaera* is concerned. It is possible that *megaera* might be confused with the variable species *ocellata* Wiedemann with which it occurs, but the former is consistently smaller with less conspicuous abdominal spots, shorter antennae and without ocellate wing markings.

Head: Eyes with considerable number of short, pale hairs. Frons (fig. 8, *d*) divergent towards antennae; black in ground colour with thin, easily rubbed, grey-brown or brown tomentum; silvery-grey or yellowish tomentum narrowly bordering eyes, paired and median spots, and median vertical line. Paired spots, velvety black, usually medium large, sometimes small, sub-triangular or nearly flask-shaped or rounded; median spot very variable in size, from fairly large to very small, usually irregularly diamond-shaped. Callus shining jet-black, or dark-brown becoming lighter centrally, curved upwards towards eye margin, with poorly defined median extension and sometimes with depressions beneath paired spots. Fawn or greyish subcallus narrow with large black or very dark brown median mark, cleft centrally. Parafacials tinged brownish beneath callus with brown spots forming incomplete parafacial band, otherwise tomentum greyish-white. Hairs dark on upper parafacials, white on lower parafacials, face and buccae. Face with grey-white tomentum, and usually ill-defined traces of irregular paired facial spots. Palpi light yellow to darker yellow-grey, second segment slightly swollen basally, tapering, bluntly pointed; hairs mixed black and white, mostly long white below and stiff black above. Proboscis dark, blackish-brown. Antennae (fig. 8, *c*): first segment shining black, bulbous, medium long or fairly short, black or dark brown with some white tomentum at extreme base and along lower edge, very variable in shape (may be short and cylindrical, sub-ovoid, more bulbous on the upper or lower surface, or basally or apically, in fact in no two specimens is this segment exactly the same although the differences are not very great), hairs mainly short, black, but some longer ones mixed with a few long white ones below; second segment small, subtriangular, with dorsal and ventral projections accentuated by stiff black hairs, light brownish in colour but appearing darker on account of the hairs; third segment orange-brown with fairly distinct notch near base and annular seam noticeably darkened, otherwise segment is rather short, medium thick with small dorsal angle. Terminal segments black, short and wide.

Thorax: Mesonotum dull brown in ground colour with the following fine, not very pronounced grey pattern: a long narrow median stripe which may be indistinct or even evanescent; rather thick, sometimes faint, sublateral stripes terminating at transverse suture and succeeded by conspicuous, grey triangles; sometimes indistinct traces of prescutellar crescents. Humeral, notopleural and supra-alar lobes grey. Hairs erect dark and recumbent pale; a patch of bristling dark hairs on notopleural lobe. Scutellum dark brown with small grey lateral patches, may have narrow median grey stripe expanded basally. Hairs mainly dark, erect, a few pale recumbent. Pleura greyish with irregular, diffuse, brown patches; hairs not numerous, and pale except for a patch of dark hairs on upper mesopleuron.

Abdomen: Dorsum dark, dull brown with a variable grey pattern as follows: distinct or diffuse grey lateral borders on first and second tergites, fading on third and fourth or absent altogether; small to medium-sized paired sublateral spots present on all tergites may be round in shape and separate from anterior border of segment or narrow, elongate, extending from the anterior border almost to the posterior border but not quite linking into stripes in any specimen available; median stripe may be complete although not very distinct, or present on anterior part of dorsum, or absent altogether; hind margins may be complete, or present laterally and centrally, or absent altogether. Hairs short, stiff, black, pale only on lateral borders and hind margins. Venter with conspicuous dark brown band centrally, otherwise grey. Hairs dark on central dark band, mixed with pale hairs laterally and entirely pale on hind margins.

Legs: Coxae: first pair with very thin greyish tomentum, dark at extreme apex, hairs long, pale basally, short and dark apically; second and third coxae brown in ground colour with greyish tomentum, hairs long, pale. Femora yellowish-brown with thin grey tomentum, erect hairs black and recumbent ones pale, apical joints a little darker with more dark hairs. Tibiae brown with light rings, 1 : 2 : 2; fore tibiae especially dark, hairs mainly black, but pale on white rings. Fore tarsi nearly black with black hairs; middle and hind with pale bases to all but ultimate segments; hairs black.

Wings (fig. 9, *b*): Rosettes clearcut, white on brown ground colour. Halteres: stalk yellow, knob brown, tip paler.

Locality: Karreedouw Mountain Pass, within sight of the sea; open country, vegetation a mixture of macchia and grassland, with many proteas. The first specimen was caught in mid-October, 1959, and the later ones in late October, 1964. They were all caught on a sunny day, when they came to the Land Rover. Although they appeared to be attracted to humans, they did not bite. Both *ocellata* and *megaera* came to the car, the former in greater numbers than the latter, and they could be separated by their sizes alone. They were most numerous in the vicinity of clumps of trees and by a field occupied by cattle.

Holotype ♀ and 7 paratypes ♀♀ in the Natal Museum. Karreedouw Mountains, west of Humansdorp, Eastern Cape Province. 28.X.64 and 14.X.59.

Two new species of the *hirta* group

Both these species run down to the *hirta* group in Oldroyd's key to the species groups (1952, p. 23). The heads are abnormally broad, as are also the frons, parafacials and buccae; they are both very shaggy species with long hairs on the head, but the eyes are only microscopically hairy and what hairs there are, are not easy to see.

The species are very similar, and as *hirta* Ricardo is a variable species, these two may be synonymous. Without intermediate material, though, there is nothing to be done but describe them as full species, and to draw attention to their difference and similarities by way of comparisons and also to their possible synonymy. This is the first record of the species group in South Africa, and so it would be a pity to delay their description indefinitely in the hope of acquiring more conclusive evidence of their status.

Haematopota montisdraconis n.sp.

In the key to the species of the *hirta* group (Oldroyd 1952, p. 104), neither this nor the following species will run out at all, which is hardly surprising as the three described species are all known from Kenya and further north. Nevertheless, they do both resemble *hirta* in several respects, especially the general appearance and the characters of the frons.

This species is closely related to the new species described next, *quathlambia*. They both occur on the Drakensberg escarpment, although separated by a fair distance, and, as *hirta* is known to be a variable species, their status is very much in doubt. However there are differences, and to emphasise these I hae added a detailed comparison to the description of *quathlambia*. The main differences are the smaller and darker appearance of *quathlambia*, together with its greater hairiness, less distinctly marked mesonotum, lack of diffuse brown patch on the buccae, longer and more slender antennae, without dorsal apical point on second segment, and scutellum lacking the median stripe of *montisdraconis*.

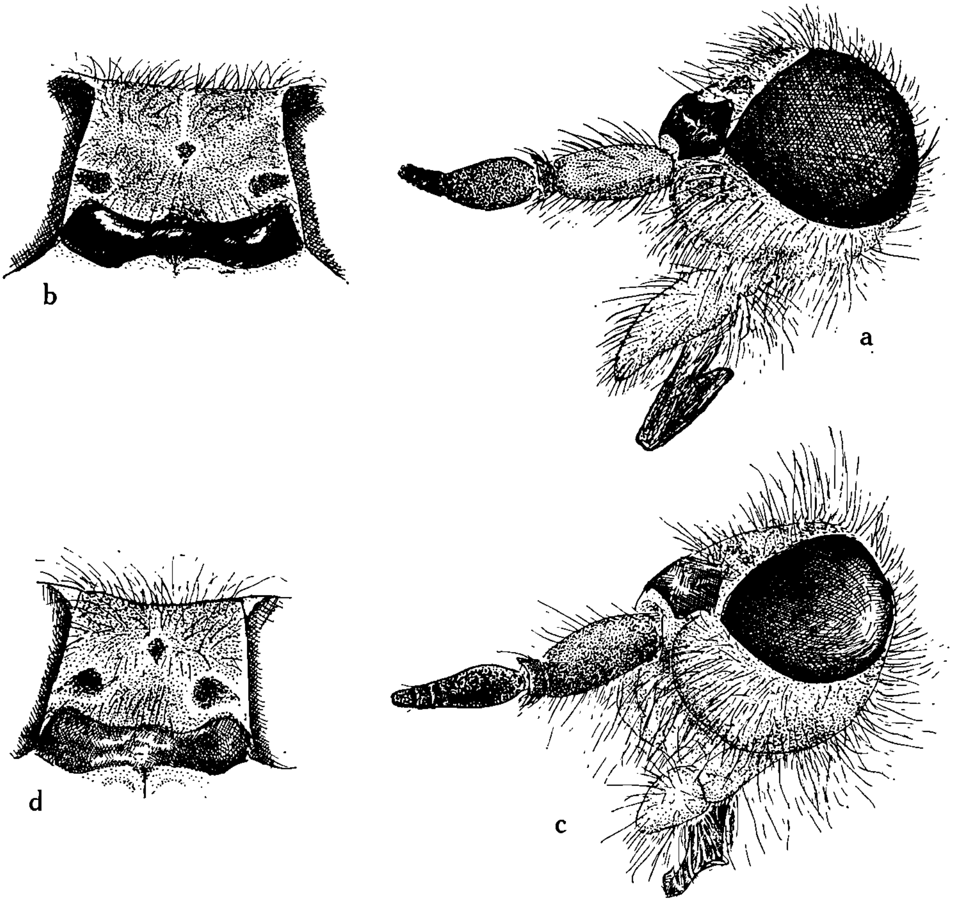

Fig. 10. *Haematopota montisdraconis* n.sp. (*a*) Female head, (*b*) frons, of topotypical specimen; (*c*) head, (*d*) frons, of Sani Pass specimen.

There is another, browner (also older) specimen collected near the Sani Pass in 1938. This shows certain peculiarities: besides the brown colour which may be due, in part at least, to ageing, it has extremely short and much swollen palpi, also the parafacials (fig. 10, *c*) are even more swollen and the face lacks spots. It does have the brown patch on the buccae and the less hairy, better marked mesonotum of *montisdracons*. A male caught at the same place is also browner, and there is more blue-grey on the face and parafacials than in the males from Naude's Nek (the type locality of *montisdraconis*). Other males from Basutoland intermediate in colour indicate that this is probably a single, variable species, but without the females no conclusion is possible. The differences between the Sani Pass specimen and *montisdraconis* are less than between the latter and *quathlambia*, and it is not an intermediate.

This species is a small, broad, hairy and very dark *Haematopota*. The grey markings are not conspicuous: the mesonotum is definitely but finely marked; the sublateral spots on the tergites are small but distinct, and the hind margins narrow but clearly defined. The parafacials are conspicuously enlarged and very hairy; looking, dorsally, down on the head, they are visible, bulging beneath the eyes. Frons dark grey, callus transverse, low, black, frontal spots medium small. Antennae with large, swollen first antennal segment, otherwise rather short and broad.

Head: Eyes with very few microscopic hairs, not at all easy to see. Frons (fig. 10, *b*) very broad, divergent towards the antennae; tomentum dull, greyish-brown, but silver-grey black or deep blackish-brown, low, transverse, reaching eye margins, with lateral and median spot to occiput. Paired spots rather small, black, triangular or comma-shaped. Median spot small, black, triangular. Hairs long, black, numerous, with down-curved tips; very occasional long silvery hairs along lateral margins and along upper callus margin. Callus black or deep blackish-brown, low, transverse, reaching eye margins, with lateral and median extensions, depressed sublaterally, bulging in profile, cleft shallowly centrally. Subcallus light grey, cleft centrally; median mark small, black or very dark brown. Parafacials very swollen (fig. 10, *a*), without definite band, black in ground colour, with light silvery-grey tomentum, thickest on upper parafacials and around eye margins, thinner on buccae, therefore this area appears a darker grey. Hairs long, black on upper parafacials, usually with brown spot around the base in the upper parafacial angles and on the area of the parafacial band; numerous, long greyish-white ones on lower parafacials and buccae. Buccae with diffuse, brownish spot or patch of tomentum. Face with thick white tomentum; long white hairs; paired spots variable in shape and size, usually circular, but maybe more elongate, ill-defined, black-brown. Palpi: first segment pale yellowish, with whitish-grey tomentum and hairs mostly long white but some long black; second segment somewhat swollen but medium long and pointed apically, yellow with whitish tomentum, and with hairs long, mixed black and white, especially dense and all white below. Proboscis of normal length, black or black-brown. Antennae dark (fig. 10, *a*): first segment with rather thin silvery-grey tomentum over black ground colour, hairs long and black, it is moderately long and definitely swollen, without dorsal apical notch; second (fig. 11, *d*) segment with slight but definite dorsal point, concolorous with first segment, hairs black; third, silvery-grey at base, shading to black apically, rather short and thick, but longer than broad, dorsal angle slight; terminal segments black, short and thick.

Thorax: Dark sepia-brown or blackish-brown in ground colour, with blue-grey median stripe, thinning before scutellum; sublateral stripes with grey triangles behind transverse suture, then continuing rather indefinitely and expanding before meeting scutellum border; laterals distinct after transverse suture; humeral, notopleural and supra-alar lobes all grey. Hairs mostly erect, medium long, black, with a few finer, recumbent, pale. Scutellum similarly coloured, with distinct median grey stripe, expanding apically, and grey lateral triangles extending and narrowing along lateral margins. Pleura dark, black-brown in ground colour with whitish-grey tomentum, and some diffuse brown patches; hairs long, white with some long black on mesopleuron.

Abdomen: Dorsum dark, black-brown, as thorax. Small to medium sized, paired sublateral spots on each segment, smallest on first tergite, becoming progressively larger until the seventh is almost entirely grey-white; distinctly broad, grey lateral margins; grey hind margins well defined; traces of median line sometimes becoming well marked from fifth tergite onwards, but sometimes a mere paling centrally especially on posterior tergites. Hairs mostly short, dark, recumbent; some longer white recumbent hairs on pale areas and many laterally on first and second tergites, fewer on third. Venter: tomentum grey with some diffusion of brown centrally, darker at apex; hairs mixed, long, pale and long, stouter black ones.

Legs: Coxae like pleura, with long, white hairs. Femora brownish-yellow in ground colour, extensively darkened apically, with whitish tomentum; hairs very long, white laterally and below, but mostly shorter and black dorsally and at tips, longer black ones on apex of fore femora. Tibiae greyish-brown with many bristling black hairs, some white ones on tibial rings; rings yellowish, 2 : 2 : 2, but the second ring on first tibia sometimes evanescent. Fore tarsi black-brown with black hairs; mid and hind tarsi extensively pale basally on basitarsi, remaining segments usually pale at joints.

Wings: With well-defined but simple pattern of rosettes, similar to *quathlambia* (see fig. 11, *c*). Haltere yellowish on stalk, brown patch on either side of knob, rim yellow.

Measurements: ♀ Body length without antennae, 7·5—8·0 mm.; wing length 6·5 mm.

Males similar to the females in main characteristics. Buccae exceedingly swollen, tomentum darker grey than in female, very thick covering of long, bristling dark hairs. Median mark on fawn subcallus is large, dark brown. Postoccipital fringe long, exceptionally long at vertex between upper angles of eyes. First antennal segment swollen, elongate, tapering slightly at apex, dark grey-brown, with many long black hairs; second segment with dorsal extension or point; third segment short, annulated about one third from the base, dark brown; terminal segments similar in colour but even darker in colour. Second segment of palpi much the same as in female, short and plump, but brownish with many long black hairs apically and a few long white ones basally. Hairs of head generally darker than in female, very long and numerous.

The mesonotal, scutellar and abdominal patterns are much the same as in the female, except that the paired spots are smaller. In one case the mesonotal markings are bluish or slate-grey, but the abdominal markings are again pale grey. The second tibial ring on the fore legs is sometimes evanescent.

The males are usually a little smaller than the females, rather darker, more slender and hairier.

Holotype ♀ in Natal Museum. Naude's Nek, Barkly East District, Eastern Cape Province, January 1963. Two ♂♂ and two ♀♀ paratypes with same data.

Notes: All the specimens were swept out of alpine grassland, a mixture of heath, sedges, coarse grasses and small flowering plants around a spongy area at the source of a spring, in the Summer. Their behaviour was curious in that they showed no interest in either humans or the motor vehicle, and were lethargic and content to sit still in the net when caught. It was unusual to sweep a *Haematopota* from so close to the ground, but there was absolutely nothing higher than the grass on which they could rest.

Haematopota quathlambia n.sp.

This species is so very like *montisdraconis* that I have included with the description a comparison of all features differing in such a way that might otherwise not be apparent. Without this the descriptions are very alike.

It is a very small specimen, smaller than any of *montisdraconis*. The colour is very dark, black brown, and the grey pattern is even more reduced than in the previous species. It has a broad, grey frons, with a low, transverse, black callus and small paired spots, also very many long black and white hairs. The pattern of the mesonotum is faint, and the abdominal spots small.

Head: Eyes bare. Frons (fig. 11, *b*) divergent towards antennae, tomentum mainly dark brownish-grey, but light silvery-grey around eye margins, paired spots and on median stripe. Paired spots small, black, elongate triangular; median spot small, black triangular. Hairs long, black, curved at tips on dark areas, but white ones on grey areas except on and around median spot. Callus very dark, black-brown, shining, medium narrow, curved upwards beneath paired spots and with large median extension; sparse white hairs laterally on callus. Subcallus light grey, cleft centrally, with median mark small and rather diffuse, dark brown. Parafacials (fig. 11, *a*) swollen, black in ground colour with thick silvery tomentum; hairs long and black on upper part, sprouting from black spots on and above the area of the parafacial band, long greyish-white hairs numerous on lower parafacials and buccae. Face with thick, white tomentum, long white hairs and poorly defined, elongate, vertical brown spots. Palpi: first segment with white tomentum and long white hairs; second swollen, elongate avoid, pointed at apex, yellow with mostly long white hairs which are especially numerous below, but a few black ones at base. Antennae (fig. 11, *a*) dark, first segment dark in ground colour but entirely covered with rather thin, silvery tomentum and having many long black hairs; second (fig. 11, *e*) small without apical extension or point, concolorous with first and with similar but shorter hairs; third, elongate, slender, with very little dorsal angle, narrowly silver grey at base, otherwise black; terminal segments black.

The frons is similar in shape to that of *montisdraconis*, but with more, long white hairs, especially around the small paired spots and above callus. Callus broader with more expanded median extension, and with more long, white hairs sprouting from it. Median mark on subcallus smaller and rather diffuse. Face, parafacials and buccae with thicker white tomentum and more hairs, parafacials less swollen than most of the specimens from Naude's Nek, and buccae lacking the brown spot. First antennal segment of *quathlambia* not so swollen and wider at base than apex; second without apial point; third without dorsal angle instead of slight but distinct one.

Thorax very dark black-brown, with pale lateral, sublateral and median stripes, and sublateral triangles behind the transverse suture; but median stripe is very short, fading and not reappearing; only very slight indication of paler marks laterally on hind mesonotal margin. Humeral, notopleural and supra-alar lobes grey. Hairs fairly long, erect, black, and semi-recumbent, long, shining white ones. Scutellum dark, black-brown, faintly grey at apex and in lateral patches; hairs as on mesonotum. Pleura dark in ground colour with greyish-white tomentum and long white hairs, a very few dark ones on mesopleuron.

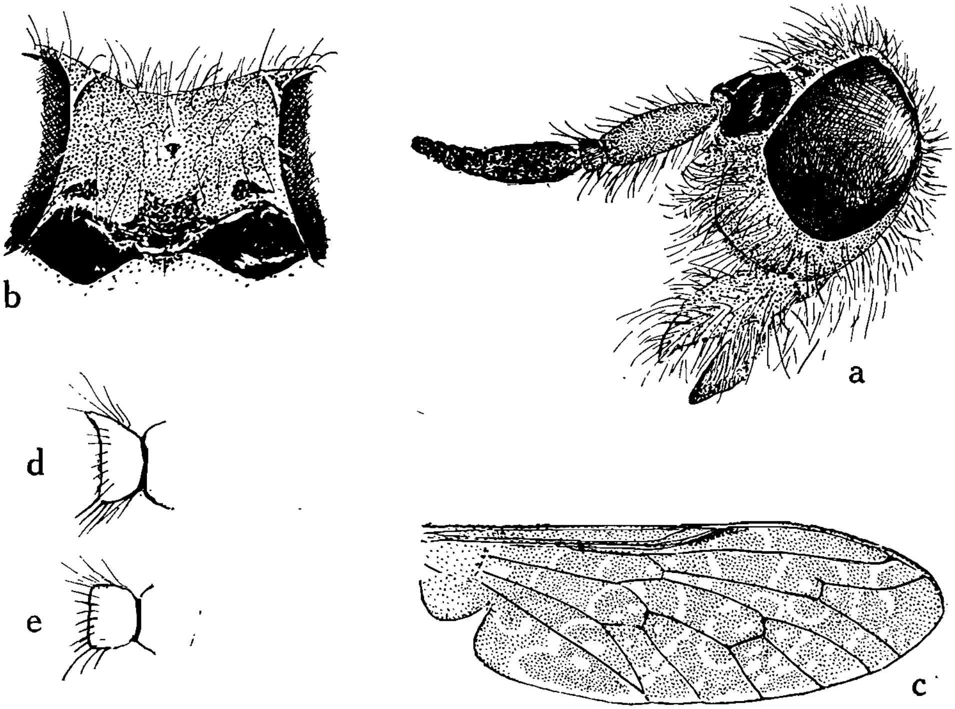

Fig. 11. *Haematopota quathlambia* n.sp. (*a*) Head, (*b*) frons, (*c*) wing, (*e*) second antennal segment; *H. montisd. aconis* n.sp. (*d*) second antennal segment.

The markings are rather less definite than in *montisdraconis;* sublaterals end at well-defined triangles after transverse suture and do not appear to continue after this; the hind border of the scutellum is only faintly greyish laterally instead of broadly so because of expanded sublateral stripes; more numerous pale hairs partially obscure pattern. Scutellum without definite grey, median stripe, and less broadly grey at apex and lateral borders. Pleura more grey and less brown, with more white hairs and fewer dark ones on mesopleuron.

Abdomen dark black-brown, with small but distinct, paired grey spots on all but the first tergite. Very narrow grey hind margins; grey lateral margins distinct on first four tergites, broadest on first and fading altogether on fifth. Hairs mostly shining pale on grey area, otherwise dark; laterally, pale hairs very numerous, and on extreme lateral edges they are very long and noticeable. Venter grey but with yellowish hindmargins, and mostly pale hairs except at extreme where they are black and bristly.

The spots on the abdomen of *montisdraconis* are larger and more conspicuous, and present on the first tergite. There is no sign of a median stripe or median triangles in *quathlambia*, and the lateral grey borders do not extend the full length of the abdomen; pale hairs more noticeable on lateral borders. Because the ventral hairs are predominantly pale, the clump of bristling black hairs is more noticeable at the apex of the abdomen in *quathlambia*.

Legs: Coxae like pleura, with long white hairs. Femora greyish, hind and middle ones tinged yellow basally; hairs mostly black on fore femora, mixed on mid and hind femora (short and black at apices but otherwise long and white, especially numerous below). Fore tibiae with one well-defined white ring basally, and one faint one, apical two thirds very dark brown with many black hairs, greyer basally. Mid and hind tibiae darker apically but less extensively, grey-brown with two clearly defined white rings; hairs dark on grey areas, light on pale rings. Fore tarsi nearly black, slightly yellowish on basi-tarsus; hairs short recumbent mostly, with a few long, erect ones, all black. Mid and hind tarsi greyish with pale bases to basi-tarsi, and pale joints. Legs altogether more contrastingly marked and strikingly coloured than *montisdraconis*.

Wings (fig. 11, *c*) grey-brown, rosettes fine, sharply defined, virtually identical to *montisdraconis*, with no consistent differences of any apparent importance. Halteres with pale stalk and dark knob, unfortunately damaged by psocids.

Measurements taken in the hope of finding some evidence for or against keeping these two as full species have been inconclusive. Frons index: of *quathlambia* 1·20, of *montisdraconis* 1·44—1·61, of the Sani Pass specimen, 1·25. The ratios, antenna length: mesonotum length, and first antennal segment length: mesonotum length showed the identical trend. Figures for the latter ratio are: *quathlambia* 3·50, *montisdraconis* 3·80—4·40, and the Sani Pass specimen, 3·99. This simply shows that *quathlambia* has rather longer antennae, and that *montisdraconis* varies a certain amount.

Body length without antennae of *quathlambia*, 6·5 mm., wing length 5·5 mm.

Holotype ♀ in the Natal Museum; Cathedral Peak, Natal Drakensberg, 6.II.61.

Notes: This species was found in *Themeda* grassland at 6,800 feet. It flew to the Land Rover; like the *montisdraconis* specimens, it was rather lethargic, and, for a *Haematopota*, the flight was weak. It was quite the reverse of elusive, in fact was extraordinarily easy to catch.

A PARTIAL REVIEW OF *Amanella*, WITH DESCRIPTIONS OF NEW SPECIES

Genus *Cydistomyia* Taylor

Subgenus *Amanella* Oldroyd

Amanella Oldroyd, 1954, Horseflies of the Ethiopian Region, vol. II, p. 75.
Type species: *Tabanus imbecillus* Karsch, by original designation.

Oldroyd (1954, p. 47) has recognised five genera among the members of the tribe Diachlorini of the Ethiopian Region and the Mascarene Islands. These are *Thaumastocera* Grünberg, *Tabanotelum* Oldroyd, *Atelozella* Bequaert, *Neavella* Oldroyd, *Limata* Oldroyd, and *Amanella* Oldroyd. All are endemic to these regions. *Thaumastocera* and *Atelozella* are obviously peculiar, and having never seen them, I am in no position to discuss them.

The only specimen of *Tabanotelum* I have had the opportunity of seeing was of an undescribed species from Mauritius. *Neavella*, *Limata* and *Amanella* have many characters in common, they are all primitive, *Tabanus*-like flies, but the characters which they do not share (mainly frontal and antennal) are strikingly different and consistent within the groups.

Mackerras (1964, pp. 96-99) has drawn attention to the difficulty of separating the whole of the tribe Diachlorini into genera and subgenera because of its unspecialised and presumably primitive characteristics. The Neotropical, Australian and Ethiopian Diachlorini must have been separated for a very long time but their evolution has been parallel and the morphological divergence is only slight. He has been unable to distinguish *Tabanotelum* from one section of the Papuan *Cydistomyia* and *Amanella* from another, and therefore has decided to sink them both in synonymy. While this does clarify the problem zoogeographically, I think there is a case for retaining *Amanella* as a subgenus. It may be that *Limata* and *Neavella* should not be considered true genera, but they are each a closely linked group with specialised features absent from the other group, and from *Amanella*. Among the African species of *Amanella* there are several different evolutionary trends which are apparently a reflection of the adaptation to different local conditions, and these must have arisen since the separation of the ancestral stock. After considering these factors as well as the implications of the prolonged isolation in time and space, I would prefer to keep *Amanella* as a subgenus for the present, despite the lack of morphological differentiation, which is presumably due to parallel evolution. The criterion Mackerras has followed is "to recognise a comparatively small number of better characterised genera, and to reduce to subgeneric level those less definable natural groups which it is still desirable to identify by name". *Amanella* seems to fall into this latter category.

The status of the other members of the Diachlorini falls outside the scope of this paper.

Oldroyd has divided his genus *Amanella* into two subgenera, *Amanella S.STR.* and *Canalicula* Oldroyd. As the new species described below and some of the new material of other species show a certain amount of variation in the subgeneric characters, I have examined certain of the species of *Canalicula*, kindly loaned by the South African Museum, in the hope of finding confirmation of this division.

The key to separate the subgenera is given by Oldroyd (1954, p. 75). *Canalicula* species have "Palpi with a longitudinal groove, which is bare of hairs. Antennae with a distinct dorsal tooth (except *sulcipalpus*). Wings clear, rarely with an appendix to vein R_4." Members of the subgenus *Amanella* have "Palpi without such a longitudinal groove. Antennae with slight dorsal angle or none (except *medialis*). Wings generally with at least a trace of an appendix to R_4." It will be easiest to consider the characters one at a time, in material which has been available.

A. Appendix to R_4. Four specimens of *pondo* all have a pronounced appendix on each wing; nine specimens of *medialis* (Oldroyd) have at least a trace on each wing; R_4 is angled and without an appendix in three specimens of *imbecilla* (Karsch) from Moçambique, but in a series of 16 almost every one has a trace at least, however there are a few with the appendix absent from one wing, and one specimen where it is missing from both; one specimen of *grayi* (Oldroyd) has no appendix; one specimen of *ingridina* n.sp. has a distinct appendix on each wing while the other lacks even a trace;

cooksoni n.sp. has no trace; three specimens of *nana* (Wiedemann) have distinct appendices on each wing; *angusta* (Oldroyd), a single specimen, also has them; *furcata* (Oldroyd), 1 ♂ and one ♀, both have R_4 distinctly angled but without an appendix; *sulcipalpus* lacks an appendix and R_4 is smoothly curved. The last four species and *grayi* are *Canalicula* species.

B. Dorsal angle of third antennal segment. This prominence is relatively so slight when compared with the *Tabanocella* species, that it will here be referred to as the dorsal angle and not the dorsal tooth. Since the publication of Oldroyd's key four new species of the *Amanella* group have been found, *emergens* (Oldroyd), *cooksoni* n.sp., *ignota* n.sp. and *ingridina* n.sp. In *ignota* the third segment is fairly narrow, in *cooksoni* it is even broader than in *medialis*, and the other two are intermediate but still with definite dorsal angles. Different specimens of *imbecilla* vary a lot, and some have antennae quite a lot broader than illustrated by Oldroyd, especially those from Moçambique.

C. The longitudinal groove on the palpi. One specimen of *emergens* has a long bare patch on each palp, looking remarkably like an incipient groove, but the area is not noticeably depressed. The other specimen shows no sign of this. The two females of *cooksoni* have a bare patch on each palp, which is slightly depressed but less pronounced than any of the *Canalicula* species I have seen. The specimen *sulcipalpus* has hairs in a very deep groove.

After considering this evidence, it seems impossible to keep *Canalicula* as a separate subgenus.

It is interesting to observe trends in the subgenus, and to speculate on possible relationships. The species with the least obvious affinities is *emergens*, in which the shape of the head in dorsal view, the contrasting colours of the legs (femora with tibiae) and of the antennae, and the uniform grey colour of the frons tomentum, are unique among the Cape *Amanella* species, although the colouring is very similar to that of *cooksoni*. Here I would like to draw attention to the general agreement between the descriptions of *emergens* and *sulcipalpus* (Loew). There are several minor differences such as brown instead of black femora, and sublateral spots instead of lateral triangles as well as the apparently more important difference of a pronounced palpal groove in *sulcipalpus*. It may be that these are closely related species and a link between the species in the climatically separate Western Cape and those inhabiting the forests and savannahs further north. It is my belief that the specimen referred to as *sulcipalpus* by Oldroyd (p. 83) from Stellenbosch is related to the other species in the Western Cape, and is not Loew's species from Kaffraria; not only are there a few discrepancies when comparing the Stellenbosch specimen with the description (as Oldroyd has remarked), but none of the known species has been found in both the summer and the winter rainfall areas. From observations, most southern *Amanella* species are rather restricted in their distribution.

The species in the Western Cape seem to be closely related, all with a distinct palpal groove, and a very similar general appearance. Of these *nana* and *sulcipalpus* have an abdominal pattern made up of median triangles and sublateral spots. The remaining Western Cape species and *amblychroma* have unpatterned abdomens. The palpi of *pondo* are the stoutest and shortest in the genus, and most closely resemble those of *furcata* (the palpi of *sulcipalpus* cannot be included in the comparison as the type has not been located and the description is not clear on this point). The antennae of *pondo* are the narrowest in the group, they are awl-shaped without any dorsal angle.

Although *pondo* has certain characters in common with the species of the Western Cape, it has more obvious affinities with a group of silvicolous species further north. The general shape and appearance of *pondo*, *medialis*, *ingridina*, *ignota*, and *cooksoni* are similar, although *medialis* and *cooksoni* are very boldly marked species, virtually black and white, while the others have a more subdued yellow-brown and white colouring. Both *pondo* and *medialis* have infuscated wing veins. Members of this group are from a similar type of *Podocarpus* forest, except *cooksoni* which is from montane tropical forest. The forest at Port St. John's, the habitat of *pondo*, although at the coast, has the characteristics of a lower montane forest and occurs on hills rising steeply from the shore. An escarpment running through the Natal midlands into Zululand is the habitat of *medialis* which is known from several localities at an altitude of between 4000 and 4500 feet, with the exception of Town Bush Valley which is about 3000 feet and part of the same formation. At Gillitts, Natal, much closer to the sea, is a patch of vestigial valley forest, the habitat of *ingridina*. As the area separating the highland forest in Natal from the lowland forest at Gillitts is devoid of forest, there seems to be a clear, if perhaps not entirely natural, geographical separation of the species. The Port St. Johns area is well known for endemism in its fauna, so the presence of a distinct *Amanella* is not unexpected. The species from further north in the Transvaal, at Haenertsberg, is found in upper montane forest, and is obviously closely related to the more southern species. The most distinct species, both in its black colour and general shape, is *cooksoni* from the forest in the Vumba Mountains. It is somewhat stouter and more *Tabanus*-like, with brilliantly coloured antennae which are even broader than those of *medialis*.

Another group occurs in Rhodesia and further north. Apparently *amblychroma* (Speiser) is closely related to *imbecilla* (I have not seen a specimen of the former species). Although *imbecilla* occurs in the Vumba with *cooksoni*, it does not seem to be a close relative of the forest-dwelling group, in fact it is so similar to *grayi* that it can be distinguished only microscopically. I feel that the many characters which they have in common as well as their (relative) geographical proximity, must outweigh the importance of the palpal groove and broader antennae of *grayi*. These three species are small, unspecialised and without a pattern on the abdomen.

In conclusion, although the species of *Amanella* are not highly diversified, there would seem to be four groups, one in the Western Cape, the second in Kaffraria (the Eastern Cape), a more northern forest-dwelling group, and a group of small, rather unspecialised species going still further north from Rhodesia up into East and Central Africa.

Cydistomyia (*Amanella*) *medialis* (Oldroyd)

Amanella medialis Oldroyd, 1954, Horseflies of the Ethiopian Region. **2**: 80.

Recorded previously from Harding in southern Natal, Balgowan much further north in Natal, and N'Kandhla in Zululand. The following two new records are based on material in the Natal Museum: 8 ♀♀ Karkloof Range, December 1961—January 1962;

Town Bush Valley 2 ♀♀ December 1961 and March 1964. All these places are on an escarpment running through the Natal Midlands and on through Zululand, and the localities were all around 4000-4500 feet.

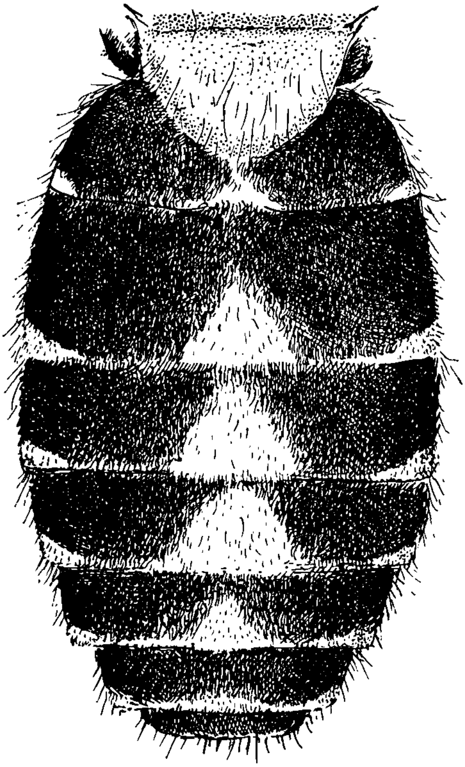

Fig. 12. *Cydistomyia* (*Amanella*) *medialis* (Oldroyd). Female abdomen.

At the Karkloof locality, during hot sunny weather, cattle in a Wattle plantation were being pestered by numerous tabanids of several species. There are no records for cloudy weather, but as this is not considered good for collecting Diptera such days are avoided. The other tabanid species present were: *Philoliche* (*P.*) *aethiopica* (Thunberg) in great numbers; less common, *Philoliche* (*Phara*) *bivirgulata* (Austen); *Haematopota obscura* Loew in large numbers; *H.mephista* n.sp.; *Tabanocella denticornis* mostly of the very dark and medium dark *natalensis* form; *Tabanus variabilis* Loew and *C.medialis* were relatively rare. *C.medialis* appeared to be attacking the undersides and legs of the cattle, as were most of the tabanids, with the exception of some *H.obscura* and some *P.aethiopica* both of which frequently attacked higher up, *obscura* settling to feed, and *aethiopica* hovering. The cattle were restless and their condition was poor. Swarms of tabanids left the cattle to follow the moving Land Rover, and so were easy to catch.

The Wattle trees grow on hill slopes which are now mostly grass-covered outside the plantations, but which were probably completely forested at one time. In a nearby patch of indigenous forest, through which runs a stream but which was not used by cattle, we were occasionally bitten by *medialis*.

A single specimen of *medialis* flew into the Land Rover on a rather impoverished piece of forest near Pietermaritzburg, known as TownBush. The car was stationary, and no cattle were in sight. This is a much visited and collected-in piece of forest, and it is remarkable that this should be the first records of the species there. Several times cattle have been swarming with *H.obscura* and *Tabanocella denticornis* but did not have a single *medialis*. The second specimen was caught at night by Mr. T. Schofield who has often caught tabanids in the area.

The specimens in the Natal Museum deviate from the description given by Oldroyd in a few minor respects:—

The positioning and size of the frontal patches varies greatly, and in one case a small vertical triangle of white tomentum extends from the white occiput. The colour of the palpi is very variable, yellowish-grey being the most common, but some are tinged with brown. The dark triangle on the parafacials extending from the subcallus reaches the tentorial pits in one case only, and does not usually extend much beyond the bases of the antennae.

In life the eyes have a single, narrow, inconspicuous stripe. Abdominal pattern in fig. 12, palp and antenna fig. 16, *a*, *c*.

Cydistomyia (*Amanella*) *pondo* (Oldroyd)

Amanella pondo Oldroyd, 1954, Horseflies of the Ethiopian Region, **2**, p. 77.

Port St. Johns, Pondoland (type locality): XI. 1916, H. H. Swinny; XI. 1961 B. R. Stuckenberg, 2 ♀♀ in Natal Museum.

There are no collector's notes with H. H. Swinny's specimens, but the two later ones were caught in the forest on a hill above the town, about 500 feet above sea level. This species flies silently and, for a tabanid, rather slowly; the green, glowing eyes are most spectacular. Both my husband and I were bitten on the leg and noticed that the bite is just like that of *ingridina*. One specimen was caught at the tyre of a car, but we did not see cattle in the forest being attacked, although that may have been due to the lower parts of their legs being hidden in the vegetation.

The description given by Oldroyd (1954, p. 79) is based on a unique. There is some variation among the four specimens I have been able to study which may be worth noting here, although the chances of confusing *pondo* with any other known *Amanella* are very remote.

Head: ♀♀ only. Eyes in life unbanded, glowing green, with numerous inconspicuous short brown or yellowish hairs. Calli vary from pale yellow-brown to bright reddish-brown; they are slightly inflated and the appearance of the tomentum indicates that the variation in the shapes is just due to rubbing. Upper callus sometimes small, almost square, attached to a linear upper callus which is completely surrounded by dark tomentum; or the lower callus may be a broad-based triangle reaching the eye margins (but it is usually separated from them by a strip of tomentum), connected to a lanceolate or even leaf-shaped upper callus with very little surrounding tomentum which reaches the ocellar tubercle. The colour of the tomentum may be yellow with brownish patches, or ashy grey with dark brown patches; the yellowing is not apparently due to fading. One patch encloses the ocellar tubercle, and may be elongate or a broad V, and the other may enclose the upper callus or be reduced to small, lateral, comma-shaped marks. Ocelli, one or all three, may be visible, but are vestigial, clearly non-functional. The prominent subcallus is covered with thick tomentum in well preserved specimens, but is easily rubbed and is usually shining to some extent. The grey tomentum of the parafacials may have distinct brown tinge in the upper angles or may be only faintly tinged with yellow. The plump, tapering palpi (fig. 16, *l*) may be all grey or all brownish. Three specimens have no dorsal angle on the third antennal segment (fig. 16, *f*), one has a slight hump and is therefore not really awl shaped; in one specimen the antennae are virtually black with only the first two segments slightly paler and traces of brown basally on the third segment, in the others the third antennal segment is entirely orange or yellow-brown.

Thorax: The mesonotum is dark brown and the pattern is made up of ashy-grey tomentum over reddish-yellow ground colour of the stripes. Dark median mark very fine but distinct. Sublaterals well-defined, broadening towards scutellum but not uniting to form a prescutellar patch. Disc of scutellum dark brown with reddish-yellow border covered with grey tomentum, which may be narrow or very extensive.

Abdomen (fig. 14, *c*): Dorsum usually dark brown, but may fade to yellow-brown, pattern greyish: median triangles, hind margins, and sublateral markings which may be spots, triangles or irregular quadrangles.

Legs reddish brown as described by Oldroyd, but with a varying amount of dark brown or near-black on all the joints especially noticeable on the forelegs and on the tarsi.

Wings show little variation; they are conspicuously darker than *medialis*, with longer appendix to R_4. Halteres: stalk pale basally, darkening towards knob which is dull, dark, almost black.

This is by no means meant to be a complete description, but is intended to give some idea of the variation which can be expected. The detailed description can be found in Oldroyd (1954, p. 79).

Cydistomyia (*Amanella*) *imbecilla* (Karsch)

Tabanus imbecillus Karsch 1887, Berlin Ent. Zeitschr. **31**, p. 370.

Previously recorded from Tanganyika: Usambara area; Amani. Uganda: Ruwenzori Range, Bwamba Pass, West Side, 5500-7500 ft. Rhodesia: Chirinda Forest, 60 m. S. of Melsetter, 6800 ft.; Vumba Mountains. Portuguese East Africa: Milange. New record: 3 ♀♀ collected by Mr. B. R. Stuckenberg at Villa Paiva d'Andrade, Manica-Sofala District, Portuguese East Africa, October, 1957.

An interesting collection of this species was donated by Mr. D. M. Cookson who obtained a long series from Laurenceville, Vumba Mountains, both males and females, showing a large amount of variation. Another long series from the Transvaal Museum, collected by P. A. Sheppard in the Umtali District, September 1931, is also variable. A single specimen from Stirling Farm, Melsetter District, September 1930, is of the same colouring as the Gorongosa specimens and the palest of the Vumba series.

A single specimen of a dark grey *Amanella* which appeared to be a new species arrived from Mr. Cookson. It differed from any *Amanella* known in the area on account of the grey-black colour, but morphologically there was a suspicious similarity to *imbecilla*. Later a long series arrived showing a continuous colour range and it became impossible to separate off the dark ones even to describe as a melanic form. The palest specimens at the opposite end of the series compared well with the Gorongosa specimens which had been confirmed by Oldroyd as *imbecilla*. The colouring of the extremes is quite strikingly different, but the shape of the frons, calli and antennae is convincingly similar. If there is more than one species here I think other criteria will be necessary to separate them. Possibly measurements and ratios treated statistically might solve the problem, but there is insufficient material from other localities to give a significant result. Biological studies and field notes could be an important contribution.

Oldroyd (1954, p. 77) mentioned only that the palpi varied in the species *imbecilla*, the Rhodesian specimens being more slender than those further north; all those I have seen have been slender, some slightly thicker basally than others, but not much different. He does not mention any colour variation, so presumably those in the British Museum (N.H.) are all of the paler variety. This could mean that the Vumba has a variable population in the midst of a fairly constant one, perhaps isolated by the different conditions prevailing there. The Vumba Mountains rise abruptly from the Moçambique plain which is savannah country; their steep relief, the high rainfall and the varied vegetation may be the cause of the lack of uniformity of colouring locally within the species. If this is the case it is reasonable to expect this species to occur throughout the Eastern Highlands in this variable form, and yet I have heard of no others. The single specimen from Melsetter in the Chimanimani Mountains south of the Vumba but still in the Highlands, is very pale like those from Gorongosa. Perhaps this specimen was from the savannah grassland near Melsetter, not in the mountains, and the dark ones in the nearby forests have not been caught. Possibly the pale colour has some selective value in the savannah lands, but the specimens from further north in the mountains must also be fairly light according to Oldroyd's description, certainly not blackish.

A curiously similar *Amanella*, which must be a close relative, is to be found in the Zoutpansberg in the Eastern Transvaal. Unfortunately only 3 ♂♂ are so far known, which are distinguishable from *imbecilla* by the more swollen parafacials, darkened in the upper angles, and the longer brown hairs on the eyes. The colouring of these males falls within the range of the *imbecilla* specimens from the Vumba.

Another group posing a very similar problem also in the Vumba Mountains, is the *Philoliche* (*Phara*) *speciosa* (Austen) trio of subspecies. The typical form and the subspecies *bracteata* are widespread in occurrence, but *bicingulata* is so far known only from the Vumba where it has been caught with *bracteata* by Mr. Cookson. A closely related species, *P.nigra* Santos Dias, is found in the nearby Amatongas Forest.

Head: Oldroyd mentions that in the Rhodesian specimens he has seen the palpi are unusually slender, and all the *imbecilla* females I have seen, from Rhodesia and Portuguese East Africa, certainly have long slender palpi (fig. 16, *h*, *k*). The palpi may be dark brown with black hairs, or orange-brown with brown or black hairs and a darkened apex, or

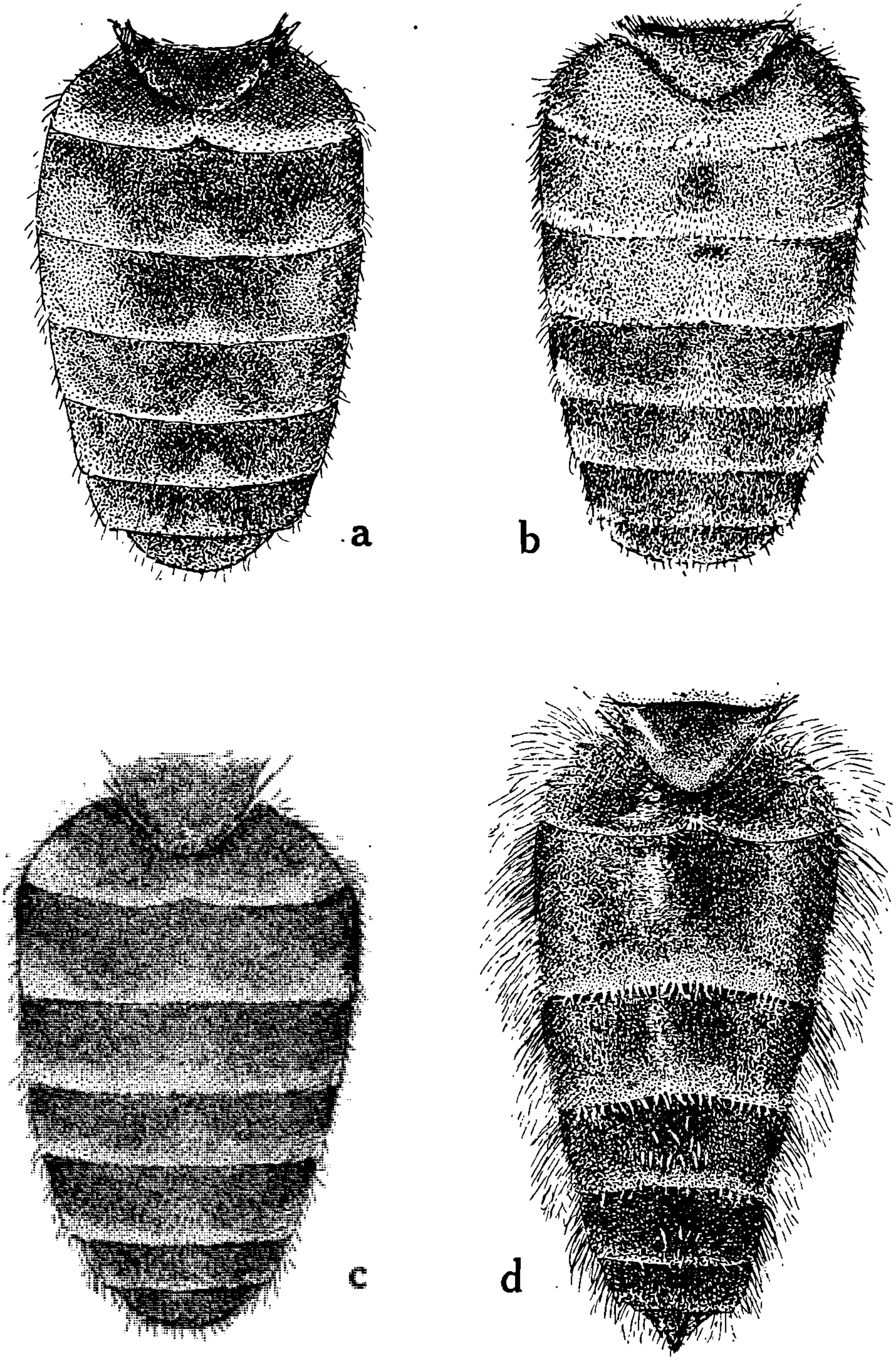

Fig. 13. *Cydistomyia* (*Amanella*) *imbecilla* (Karsch) (*a-c*) Three variations in the pattern of the female abdomen, (*d*) abdomen of male.

reddish-yellow with whitish tomentum which results in a pinkish colour. Antennae: first two segments are yellowish with traces of whitish tomentum, hairs black; third segment rather narrow, with a more or less definite dorsal angle (fig. 16, *i, j*), may be light orange, deeper orange-brown, dark red-brown, or with varying amounts of diffuse black or brown, or almost entirely dark; terminal segments like third or darker, may be sooty.

Thorax often darker than described by Oldroyd, mostly black; sublaterals, supra-alars, lateral borders may be yellowish-orange, or darker reddish-brown, extensively or only narrowly, but the dark specimens show only slight reddish diffusions on supra-alars, lateral borders and hind margins of the mesonotum; sublaterals are apparent only as thickened patches of tomentum on anterior part of mesonotum. Scutellum orange apically, with a variable amount of dark basally, or may be entirely blackish; thin tomentum greyish.

Abdomen is described as being extensively orange basally, otherwise dark brown with pale hind margins. The paler specimens from Gorongosa, Stirling Farm and from the Vumba have the first three tergites yellowish-orange or yellow-brown with some darkening on the second tergite which may be a brown diffusion or a black spot, third tergite may or may not have a black spot (fig. 13, *b*); from the fourth tergite onwards the abdomen is browner, brownish-grey or blackish, this may be an abrupt change. Other Vumba specimens have black markings centrally on all tergites (fig. 13, *a*) extensive dark spots on first three tergites and usually on the dark terminal tergites as well. The blackish central areas increase laterally throughout the series until only a flash of orange-brown is left on the sides of tergites two and three; finally there is a totally dark, slaty or grey-black abdomen (fig. 13, *c*). The hind margins to the tergites are pale and are expanded medially and laterally slightly but do not form definite triangles; hairs are pale on these areas, and also give an indication of the median and lateral triangles.

Legs may be uniform orange-brown with only the tarsi a little darkened; may have femora definitely darker than tibiae, first tibia darkened apically; or femora black, tibiae dark red-brown, fore tibia very extensively darkened apically, tarsi darkened, fore tarsus usually black.

The light specimens have pinkish palpi, orange or orange and brown antennae and exetensive patches of yellow-orange on the thorax with only a trace of dark between supra-alars and light latral borders. Those with all tergites darkened centrally have darker palpi, and darker and often contrastingly coloured antennae. The darkest of all, with black abdomens, have dark brown palpi, blackish or brown antennae, and only traces of colour on edges of thorax.

♂♂ None of those which I have seen (more than 60) are completely dark, all have at least a trace of yellow-brown on the abdomen. The majority are rather dark, with orange-brown or yellow-brown laterally on the first four tergites, but except for the lack of a wholly dark specimen, the full range of colour variation is also found here.

Head: Eyes contiguous for most of the length, hairs sparse, not conspicuous. Frons very small, brown. Parafacials, face and buccae dark grey with long black hairs, parafacials slightly enlarged but not conspicuously swollen. Palpi short and plump, but relatively long for a male tabanid; first segment yellow-brown with long black hairs and a few long pale ones; second segment appearing pinkish usually because of the yellowish tomentum covering the brown ground colour, otherwise brown or yellow-brown, with long black hairs above and shorter bronze or black ones below. Antennae shaped as in female, with the same colour variations.

Thorax: Mesonotum and scutellum shining but not brilliantly, more so than in female. Hairs short, recumbent, bronze-brown and long, entirely black or dark brown, or entirely long, grey, or mixed, with grey ones anteriorly and laterally. Both thorax and abdomen much more hairy in appearance than female.

Abdomen: More elongate and narrower than in female, slightly more shining and with longer hairs. Colour varies as in female, except for the lack of a completely dark form.

Legs: As in female.

Wings of both male and female are long, clear, either colourless or yellowish, with yellow-brown or brown stigma. Appendix to R_4 usually present, but not invariably.

Size: The size of most of the specimens available is around 11 mm.,varying from 10-12 mm., but there are several smaller ones, and two of only 7 mm. length, which appear to be otherwise normal.

Notes: Mr. D. M. Cookson (*in litt.*) has written of his methods of collecting and of observations made while doing so. He has made a large and valuable collection of tabanids from the Vumba, including many specimens of *imbecilla,* and his observations are most interesting, especially as they are continuous throughout the year. I can do no better than to quote him in part. He has caught *Amanella* spp. at an artificial mud patch in an open glade, surrounded by forest but without tree cover. Later he "found a place where a spring formed two small pools, below which was an area of bog. The top pool is in a pit and is unworkable; the lower one is ideal. There are trees all around, without much undergrowth, and the sun breaks through the canopy to shine on some portion of water and mud until 1300 hrs., when it moves behind a barrier of dense leaves. Between 0930 and 1300 hrs. is collecting-time. The mud around the pool has been cleaned and smoothed, and is kept moist by splashing. October and early November is our hottest and driest period, so there is very little other mud to compete with this spot. At the end of October (1964) there was an inch of rain, followed by a week of cloudy weather; mud was everywhere, and the pool was deserted. When all was dry again and the hot weather had resumed, tabanids reappeared at this water-bait. . . . *A.imbecilla* . . . are practically over now (14.XI.64), only a few tattered specimens are to be seen. All were taken on, or near, mud in the forest, and the species has not yet attacked me. The males have the habit of diving fast to touch the water; after breaking the surface, some fly up towards the canopy, others immediately turn aside to settle on the mud, on fallen leaves, or on the bare ground beside the pool. Quite a few drowned males have been seen in the pool, and also in the house filtration-tank which is open-topped; as the water is clear, and not at all muddy, they may have misjudged the position of the surface and dived too deep. They suck at mud, on sodden vegetation, or settle on dead leaves floating on the water and suck over the side. At the outlet of the pool the water trickles away very shallowly, and this gentle flow is dammed by leaves and twigs; in front of these 'dams' a surface scum builds up, and the males settle on this, held up by surface tension, and suck directly at the water." It seems probable that females would oviposit in the vicinity of such pools, but Mr. Cookson does not mention having noticed this. The adults are to be found from September to mid-November.

The Gorongosa specimens were caught inside a Land Rover on a sunny day in early summer in bush savannah near a stream. The whole series caught by Mr. Cookson came from forest at Laurenceville in the Vumba Mountains, well above the savannah lands, in an area of high rainfall. The full colour range was caught by him in November (in mid-Summer) at this place. From this it seems that the yellowish, paler form is not necessarily a dry country form and the darker one associated with high rainfall.

Cydistomyia (Amanella) ingridina n.sp.

This is a medium-sized, rather slender, grey and brown species. The almost conical abdomen has a prominent pattern of greyish triangles, lateral and median, linked by pale hind margins. The scutellum is pale and the mesonotum distinctly striped. A conspicuous dark line runs from the edge of the humeral lobe across the notopleural lobe to the wing base.

This species is obviously closely related to *medialis* and *pondo*, but it can be easily distinguished from these; it has the same abdominal pattern as *medialis*, median and lateral triangles, while *pondo* has median triangles and sublateral spots; it has much the same colouring as *pondo*, although *pondo* is more yellow, but *medialis* is such a dark brown that it appears almost black and white. The wings of the known specimens of *ingridina* are altogether clear, whereas both the other species have infuscation on the wing veins in a greater or lesser degree. Although the abdominal patterns of *medialis* and *ingridina* are basically the same, the triangles of *medialis* are smaller and more widely spaced. The antennae of *medialis* are darker, and have a more pronounced dorsal angle, the frons is similarly banded, but more contrasted in colour, the lower callus is darker, less bulbous and not so brilliantly shining, and in life the eyes have a single horizontal band as opposed to the double band united at the posterior edge of the eye of *ingridina*. The eyes of *pondo* are dark glowing green, and are unbanded, and the third antennal segment is almost straight dorsally, with a small notch, not a dorsal angle. The third antennal segment of *ingridina* is similar in shape to *emergens* and those specimens of *imbecilla* in the Natal Museum from Rhodesia and Portuguese East Africa. These species also have clear wings and slender elongate palpi, but in other respects they are completely different.

Only two *ingridina* specimens have been caught, both in a small patch of riverine forest at Gillitts, Natal. Unfortunately it seems to be a rather variable species in certain details, but the overall pattern is constant and very different to *medialis* for which it is not likely to be mistaken. A typical specimen of *medialis* is known from Town Bush, Pietermaritzburg, not 50 miles from Gillitts. However *medialis* is known only from an escarpment which runs through the Natal midlands, and Town Bush is the lowest recorded locality. The altitude of the Empolweni valley at Gillitts where *ingridina* is to be found is between 1500 and 2000 feet, Town Bush is about 3000 feet. Only impoverished patches of forest exist between these two places.

Head ♀. Eyes in life with two narrow, horizontal bands united at each outer eye margin, hairs short, sparse. Frons (fig. 17, *a*) narrow, nearly parallel sided but slightly divergent in the larger specimen and biconvex in the smaller one; tomentum in bands of dark brown and greyish-white, central patch below and partly including, or completely surrounding, ocellar tubercle. Position of dark patches varies on the two specimens. Hairs short, stiff, black, semi-recumbent, erect at vertex. Lower callus brilliantly shining, dark red-brown or almost chestnut, approximately rectangular, in profile slightly bulging, especially towards the lower margin. Upper callus linear, slightly wider at upper end, not reaching ocellar tubercle, narrowly united with lower callus. Subcallus bulging slightly but distinctly over antennal bases, shining dark brown through thin white tomentum. Parafacials mainly with thick, glistening greyish-white tomentum, but with brown tomentum extending from subcallus across upper angles of parafacisls to eye-margins, making brown triangles. Hairs short, dark, erect. Face and buccae with glistening greyish-white tomentum. Hairs on face mostly dark, mixed with white at lower edge; long, white on buccae. Palpi (fig. 16, *g*): second segment slender, elongate pointed; tomentum greyish-white tinged with yellow; hairs mostly long, white on first segment, shorter and finer on base of second, short, black on approximately apical two-thirds. Antennae (fig. 16, *e*): first segment about twice length of second, both brown with short black hairs; third segment with distinct dorsal angle on which are a few short, black hairs, in colour, orange-brown; terminal segments narrowing sharply, darker orange-brown, colour deepening to near black apically, a few short black hairs at extreme apex and at apex of each segment.

Thorax: Mesonotum dark brown, or slightly reddish-brown, in ground colour, subshining through very thin grey-brown tomentum. Darker, very narrow median stripe extends back to ill-defined, longer than broad, prescutellar patch. Broad lateral and median stripesof denser tomentum extend lengthof mesnotum, in colour grey tinged with brown. Sublaterals expand, uniting into indefinite grey band to border the prescutellar patch anteriorly as well as laterally. Hairs mostly short, stiff, black, mixed with some long, semi-recumbent, white ones; long white hairs especially numerous on lateral and sublateral stripes of hind margins of mesonotum. A conspicuous dark brown line, with many medium-sized, stiff, black hairs, extends from lower edges of humeral and across notopleural lobes to wing base. Upper parts of humeral and notpleural lobes and whole of supra-alar lobes, greyish-white with long white hairs. Pleura yellow-brown in ground colour, with whitish tomentum, resulting in a pale grey-tinged pinkish-yellow. Hairs long, white, very numerous on upper mesopleuron, pteropleuron and sternopleuron. Scutellum light, tinged with brown on anterior margin in one case, and brownish over whole disc in other; hairs long, white.

Abdomen (fig. 14, *d*): Dorsum dark brown with, on segments two to six, conspicuous greyish-white median and lateral triangles, narrowly separated but lined basally by pale hind margins. On first segment, median triangle very small, lateral triangles large, hind margin not pale. Seventh segment with pale hind margin expanded slightly medially and laterally. Hairs black on brown areas, white on pale areas, especially long and semi-erect on extreme lateral borders. Venter banded, first four sternites brown basally with very broad, pale hind margins, remaining sternites with progressivey less white, seventh being nearly all brown. Hairs rather fine and sparse, shining white on pale areas, black, semi-erect on brown areas.

Legs: Coxae like pleura; fore coxae with many long, white hairs externally, other coxae with fewer and of lesser length. Femora light yellowish-brown with thin whitish tomentum; fore femora darker than second and third, with noticeably darker tip; third femora with dorsal dark stripes lacking tomentum. Tibiae similar; fore tibiae darkening apically from approximately half way, noticeably dark and slightly enlarged at tip. Hairs mostly black, a few pale at base; other tibiae paler but also darkening apically, hairs mixed, dark, more numerous towards apex and along dorsal surface, pale hairs most numerous on hind tibiae except at tip. Fore-tarsi brown but appearing slightly sooty, hairs black, reddish ventrally, remaining tarsi slightly paler, otherwise similar.

Wings: The larger, darker specimen has an appendix to R_4 on each wing, the lighter one has no trace at all. Wing membrane tinged brown, stigma reddish-brown or dark brown; all posterior cells open. Halteres entirely brown with slightly reddish tinge.

Measurements: Length without antennae, 10·5—11·5 mm., length of wing 9—10 mm. Frons index 4·30—4·25 mm.

Male, unknown.

Holotype: In the Natal Museum, from the upper Empolweni Valley, Gillitts, Pinetown District, Natal; 14 February, 1962; also one paratype from the same locality, 20 December, 1962.

Notes: So far only two females have been caught. The paratype specimen was the only one of the several seen that settled for any length of time. These flies were quite common, but flying silently and rapidly over a stream shadowed by trees, they were difficult to see and quite impossible to catch. The one specimen first attacked our young daughter Ingrid, after whom it is called. Some readily attacked humans, biting only the feet and legs, and occasionally one settled on the car away from the stream. They are very elusive. The bite is not a sharp stab, but starts as a rasping sensation which becomes increasingly painful. The holotype, a slightly smaller paler specimen, was caught in February, towards the end of the rainy season.

Cydistomyia (Amanella) ignota n.sp.

A.ignota does not fit in Oldroyd's key to the species of *Amanella* (1954, p. 75). The palpi are definitely not grooved, the antennae have only a slight dorsal angle so that this is a typical *Amanella*. R_4 has no appendix, although it is angled and slightly thickened at this point.

This is a medium-sized, yellowish *Amanella*, smaller than *pondo* to which it bears a surprising resemblance considering the extent of the geographical separation. It is almost exactly the same colour as a rather faded *pondo* collected in 1916. As *ignota* was collected in 1921, it would be as well to bear in mind that a fresh specimen may be darker, the brown deeper and the yellow at least partly grey, and possibly the pattern more clearly defined. Of course this is pure speculation, and the basic pattern and the morphology will remain the same, but nevertheless a faded speciman can be deceptive. It is unfortunate that the holotype is unique, but the specimen is in reasonably good condition, although the colour described here may not agree exactly with that of a fresh material.

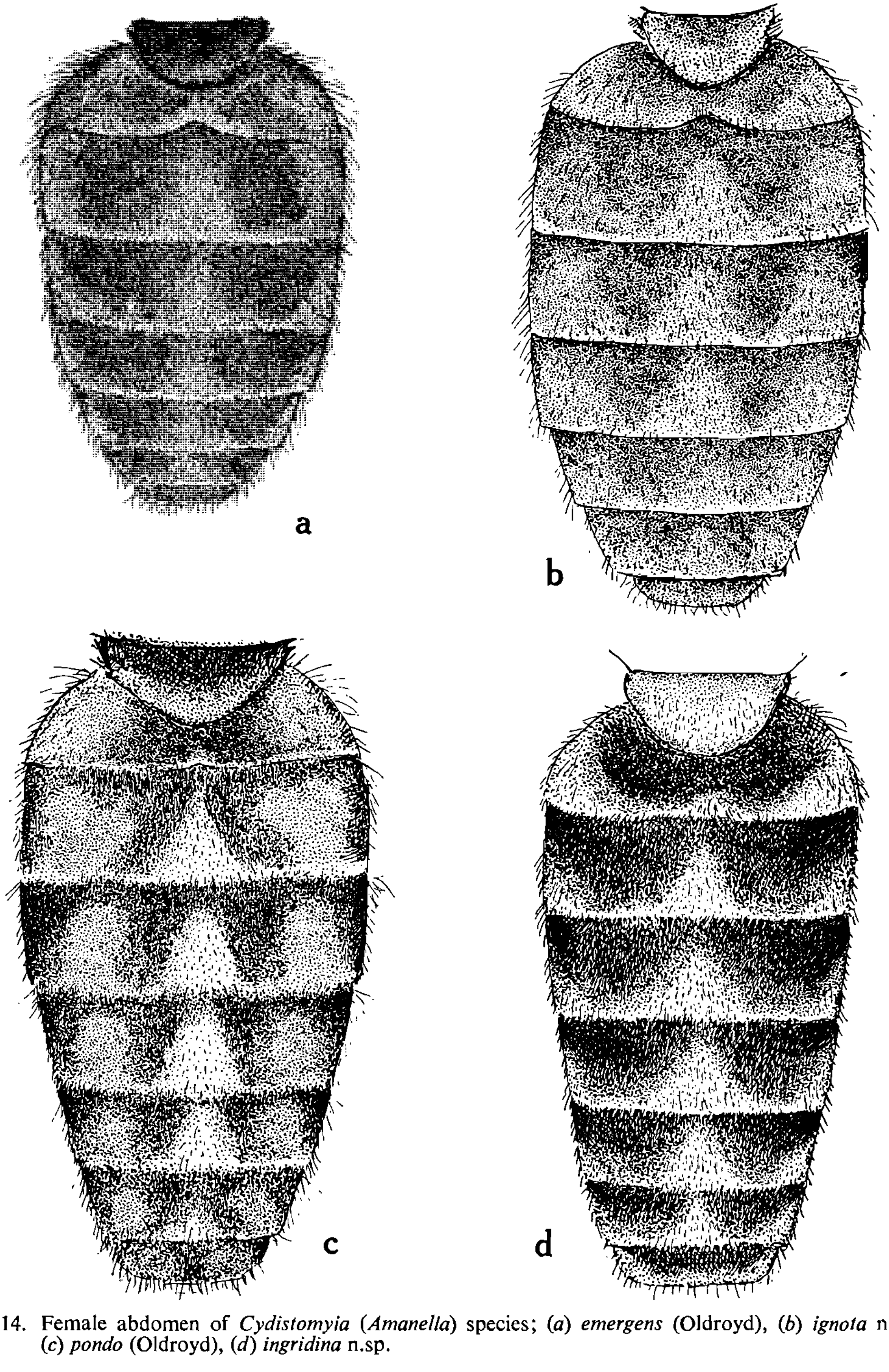

Fig. 14. Female abdomen of *Cydistomyia* (*Amanella*) species; (*a*) *emergens* (Oldroyd), (*b*) *ignota* n.sp., (*c*) *pondo* (Oldroyd), (*d*) *ingridina* n.sp.

The wings show only a very slight amount of colouring along a few of the basal veins, but otherwise there are many features similar to those of *pondo*. The palpi, ungrooved, are long, plump basally, tapering to a point, but not as plump as in *pondo*, very similar in shape to those of *ingridina* and *medialis*. Features it shares with *pondo* are the shape of the calli; a swollen, brown tomented subcallus; the markings of the mesonotum (pale borders to the mesonotum, pale sublateral stripes not uniting to form a prescutellar patch, the reddish border to the dark disc of the scutellum); and most noticeable of all, the pattern of the tergites; the sepia ground colour and the yellowish pattern made up of medium-sized median triangles, hind margins, and rather indefinitely shaped sublateral spots. Except for *pondo*, the related *Amanella* species have lateral abdominal triangles. The antennae have a slightly more pronounced dorsal angle than in *pondo*, but are otherwise similar in shape and colour although the first two segments have rather more black hairs. In fact the antennae are very like those of most other members of the subgenus.

Head ♀. Frons (fig. 17, *b*) slightly divergent towards the antennae, lower callus raised, rounded in outline, but approximately triangular, linked with linear upper callus which is well separated from vestigial ocellar tubercle; ocellar tubercle only very slightly raised, with minute non-functional ocelli. Tomentum yellow-grey above lower callus, narrowly along eye margins and in ovoid patch around upper end of upper callus, otherwise brown, varying in intensity of colour with angle of lighting. Hairs few, short, dark. Subcallus slightly swollen, brown, covered with brown tomentum through which ground colour is shining. Tomentum of face and parafacials mostly grey tinged with brown, but brown in extreme upper angles of parafacials. Hairs moderately long, mostly dark with a few white, longer ones on lower buccae, those on extreme lower edge of head long and white. Second palpal segment (fig. 16, *m*) long, fairly plump basally, gradually tapering to a point; both segments yellow-brown in ground colour with whitish-grey tomentum giving an overall pinkish-brown appearance; hairs yellow-brown and black, longer and more numerous on first segment. Proboscis short, reaching tips of palpi only, black. First antennal segment (fig. 16, *n*) much longer than second, nearly rectangular, both yellowish-brown, but colour partly obscured by numerous thick, stiff, not especially long, black hairs. Third segment with slight dorsal angle, brownish-orange; terminal segments blackish-brown.

Thorax: Mesonotal pattern only moderately distinct, somewhat rubbed in holotype. Ground colour dark sepia brown; median stripe absent, pattern consisting of sublateral stripes expanding posteriorly but still separate at scutellum border, pale edges to mesonotum, and diffuse supra-alar stripes. Humeral lobe pinkish white; notopleural lobe yellowish brown above with moderately long shining hairs, brown below with longer, bristling dark ones; supra-alar lobe yellow-grey with tuft of shining pale hairs on posterior border, otherwise with mixed light and dark hairs; hairs elsewhere on mesonotum short, fine, dark, semi-recumbent, some pale ones anteriorly and on sublateral stripes. Scutellum dark basally, broadly reddish at sides and apex with some grey tomentum; hairs pale, moderately long, shining on sides and apex, absent from disc (probably rubbed). Pleura mostly brownish yellow, with tinges of grey, darker grey ventrally near coxae, hairs long, dull, numerous, whitish.

Abdomen (fig. 14, *b*): Dorsum sepia-brown with yellow-grey pattern of medium-sized median triangles, hind borders and irregular sublateral spots; first tergite without median triangle, dark brown centrally, hind margin pale, and extensively pale laterally, with shining pale hairs on light areas. Median triangle represented by hairs only on fifth tergite and probably on sixth which is rubbed. Hairs otherwise dark on brown areas, shining whitish-yellow on pale areas, but many lost through rubbing. Venter yellowish-grey anteriorly, becoming more yellow-brown posteriorly with indefinite pale hind margins expanded laterally; hairs short, pale mixed with longer dark ones.

Legs: Fore legs darkest; coxae like pleura; fore coxae with mostly long pale hairs, some short dark ones apically. Femora yellow-brown with some greyish tomentum and long pale hairs, fore femora with many long dark hairs as well. Fore tibiae yellow-brown with mixed brassy golden and longer dark hairs, but darkened apices with only black hairs; mid and hind tibiae yellow-brown with mostly light hairs, with only slightly darkened apices. Tarsi dark brown, fore tarsi blackish.

Wings: Hyaline with yellowish stigma; no appendix to R_4; slight yellowish tinge along veins near base of wing. Squamae pale yellowish. Haltere with yellowish-brown stalk and light sepia-brown knob.

Measurements: Length without antennae 11·5 mm., wing length 10·5 mm. Frons index 4·37.

Holotype ♀, Haenertsburg, Eastern Transvaal, December 1921; C. J. Swierstra. In Transvaal Museum, Pretoria.

Cydistomyia (Amanella) cooksoni n.sp.

This is a fairly large, unusually stout and robust, charcoal and grey, dusty-looking species with small, median abdominal triangles, and clear wings (fig. 15). The black lower callus, ashy-grey frons and orange third antennal segment separate this species from the other forest-dwelling *Amanella* species. It is variable in size, and the two females known so far also differ in other respects.

The smaller female specimen is superficially like *emergens*, whereas the larger, more strongly marked one is not unlike a blackish *medialis*. In the details of the head it is more like *emergens* than any other *Amanella* I have yet seen. The colouring of the frons, callus and subcallus is virtually identical, although the frons of *emergens* (fig. 17, *c*) has a very different lower callus, which is broader than high, almost square. The antennae are also very similar in colour, but the third antennal segment of *emergens* is longer and narrower and the terminal segments contrast with it in colour. The larger specimen has more distinct markings, and is as large as the largest *medialis*. The shape of the palpi is like that of *medialis*, plumper basally than *emergens* and not as long, the tips of the palpi of *emergens* almost reach the base of the labellum. There is not much likelihood of this species being confused with any of the other members of the subgenus so far known. It is such a black fly, making *medialis* look very brown by comparison, and even *emergens* not to look black. Also it is much more hairy than any other, even macroscopically the abdomen looks hairy.

♀ *Head:* Eyes hairy, pile when looked down on with the head in dorsal view, is fairly thick, but short, white. Frons (fig. 15) elongate, narrow, parallel-sided or very slightly convergent;

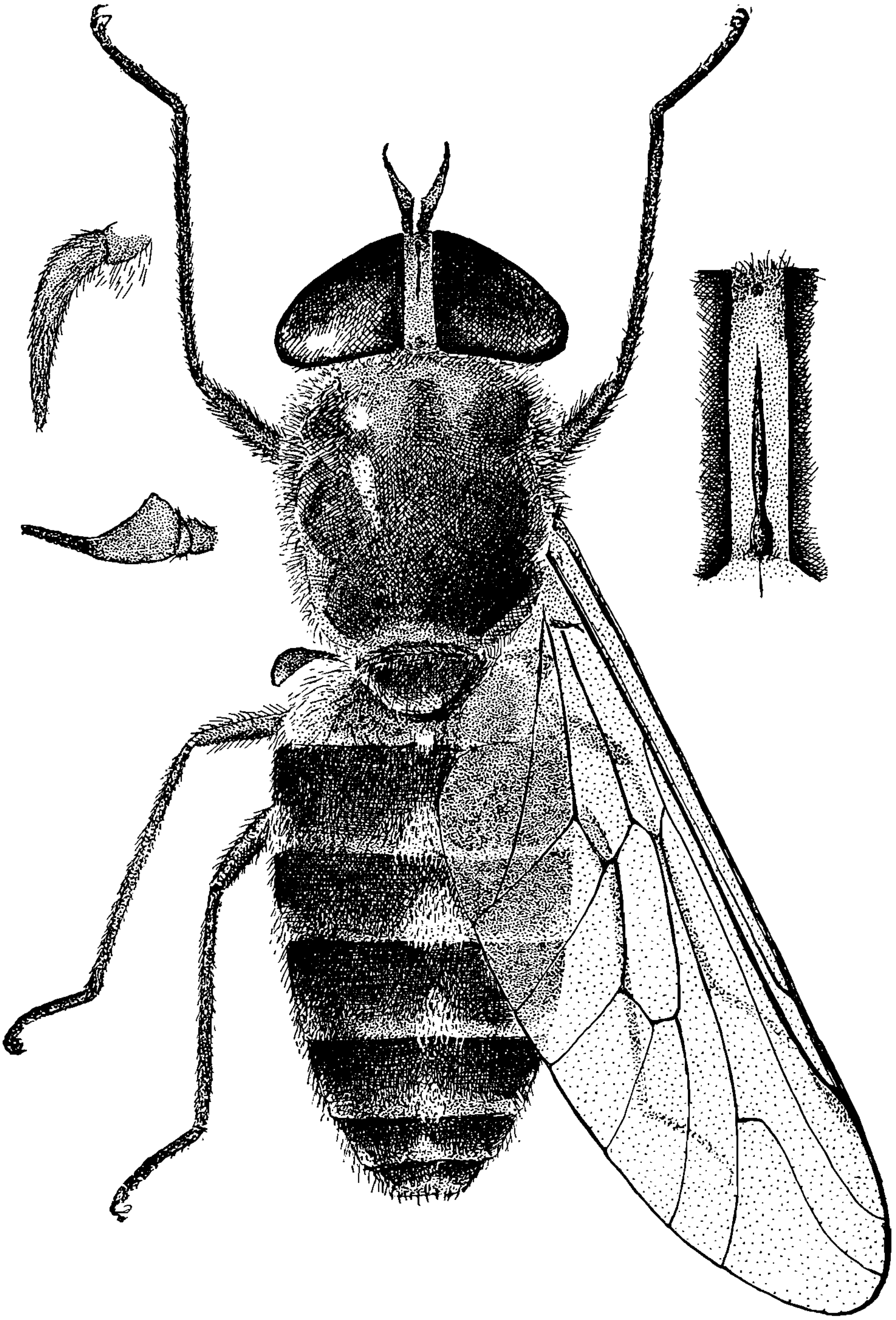

Fig. 15. *Cydistomyia* (*Amanella*) *cooksoni* n.sp. Female.

ocellar tubercle distinct, ocelli reduced or represented by untomented dark areas; tomentum grey, tinged with brown; hairs erect or slightly proclinate, predominantly shining pale yellow, some dark; tuft of longer, erect, bristly black ones at ocellar tubercle and vertex; post-ocular fringe predominantly white with a few black hairs. Subcallus slightly swollen in profile, dark brown in ground colour shading to yellow-brown around bases of antennae, tomentum thin, brown, easily rubbed to expose shining ground colour. Face black or dark brown in ground colour, with thin brownish-grey tomentum; hairs long black and white on upper outer area, shorter on lower edges, sparse. Parafacials and buccae very dark in ground colour with whitish-grey tomentum tinged brownish at upper angles of parafacials and along parafacial eye margins; hairs white, abundant, long, especially on lower parafacials and buccae. Palpi (fig. 15): first segment black with greyish tomentum; second segment elongate, narrow, pointed, brownish-yellow with a little greyish tomentum; hairs short, black, mostly stiff, but some long white ones below on the first segment and a few basally on the second; bare elongate patch on second segment not very extensive but definite and slightly depressed. Proboscis black. Antennae (fig. 15): first segment broadened apically, second very short, and with dorsal projection both dark reddish-brown with some thin greyish tomentum, hairs short, black; third segment broad but rather short, orange-brown, very slightly darkened apically; terminal segments darker brown and with overlying black sheen.

Thorax: Mesonotum dark, subshining, black-brown in ground colour, with thin whitish-grey tomentum and no very distinct pattern; median line very thin, narrow and dark brown, greyish tomentum thicker on paramedian bands, most conspicuous anteriorly, fading posteriorly, giving the impression of a broad but faint greyish band on anterior median mesonotum, varying in intensity with angle of light, not reaching scutellum; supra-alar lobes dark brown with greyish tomentum uniting with greyish hind margin of mesonotum. Hairs shining pale, recumbent, some dark erect hairs, tuft of stiff, black, long hairs on notopleural lobe; long white tufts on supra- and post-alar lobes. Scutellum like mesonotum, with indistinct bluish-white tomentum, thicker on lateral borders and apex, hairs long, pale, shining white. Pleura black-brown in ground colour, with greyish-white tomentum, hairs long, white.

Abdomen: Dorsum dull, black-brown in ground colour, with indefinite small, median, grey triangles (more extensive in the smaller specimen), largest on second tergite, decreasing in size posteriorly, evanescent on last two tergites, but represented by pale hairs; hind margins grey with yellow-brown edge, expanded laterally, especially on basal tergites, into extreme lateral triangles. First tergite almost entirely covered by ashy, blue-grey tomentum, especially dense laterally; median triangles represented by dense yellowish white hairs, two tufts of yellowish hairs below lateral edges of scutellum. Hairs elsewhere yellowish white on hind margins, median and lateral triangles, without these hairs triangles would be difficult to see despite thin underlying tomentum. Venter covered with bluish-grey, faintly irridescent tomentum, hind margins slightly yellowish. Hairs mixed, black, and white of variable length, yellowish-white on hind margin, black hairs most numerous posteriorly.

Legs: Coxae like pleura with numerous long white hairs. Fore femora black with black hairs; middle femora with thin, light grey tomentum, but bare on upper area (especially on

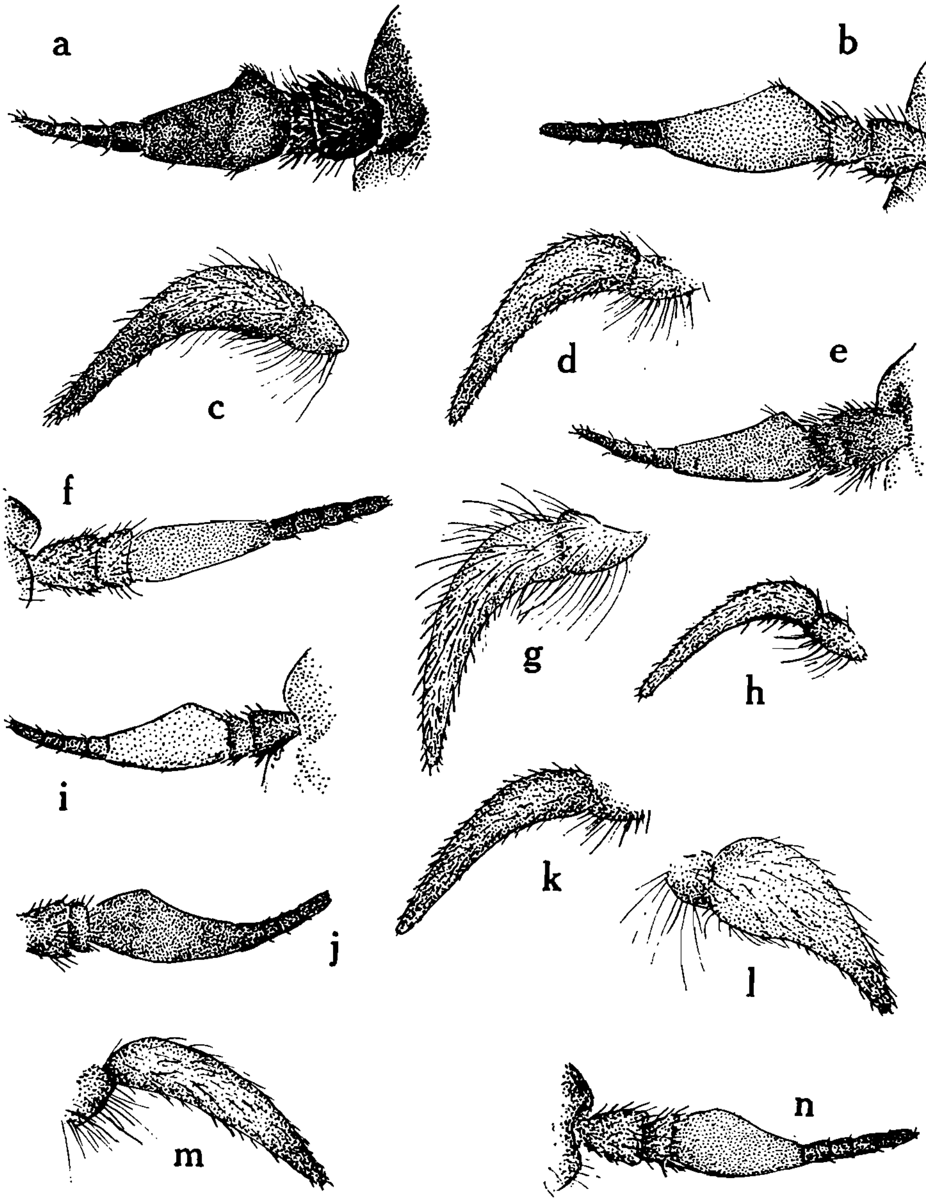

Fig. 16. Antennae and palpi of females of species of *Cydistomyia* (*Amanella*): (*a, c*) *medialis*, (*b, d*) *emergens* (*e, g*) *ingridina*, (*f, l*) *pondo*, (*h-k*) *imbecilla*, (*m, n*) *ignota*.

inside surface) and apically, hairs long white below, black apically, and black with some white on upper edge; hind femora more extensively but very thinly tomented, bare on upper edge, hairs long, white below in a fringe, a white tuft basally on upper edge, otherwise mostly short, black with some white or all pale and longer; all femora with yellow joints. Tibiae more reddish-brown, fore blacker than others, hairs mixed black and shining yellow-white; dark hairs predominantly at indistinctly darkened tips. Fore tarsi black, mid and hind black-brown; hairs black and dark red-brown.

Wings hyaline, without markings; veins dark brown; stigma dark yellow-brown; squamae dark yellow-brown. Halteres dark brown, yellowed on outer edge.

♂. Similar to female but with less pattern visible, a blacker, rather shiny fly, one very small triangle on third tergite, wings faintly tinged with orange-brown basally. Differing from the female in the following characters.

Head: Eyes more hairy, pile longer and denser. Minute ocellar tubercle present. Postocular fringe very long, hairs curled forward at tips, diminishing in length laterally, mostly black, a few shining pale yellow. Subcallus very slightly swollen, black-brown in ground colour, with ashy, bluish tomentum, shading to orange-brown narrowly but conspicuously above antennae. Parafacials and buccae somewhat swollen, with dark grey tomentum and an abundance of long, dark brown hairs, hairs on lower buccae and around bases of palpi whitish-grey, also small tuft of similarly coloured hairs on upper parafacials beneath antennae. Palpi short, inflated, first segment black with grey tomentum, long grey hairs and a few dark ones; second segment black at base shading to dark yellow-brown, with some grey tomentum, hairs shorter than on first segment, predominantly dark, a few pale hairs at base. Antennae coloured as in female, but third segment with less steep dorsal angle, therefore appearing longer and more slender.

Thorax with even less pattern than the female, similarly dark in ground colour, virtually black, but the thin tomentum making it appear slaty blue-black. The concentration of tomentum into bands much less distinct, only visible in acutely oblique lighting; however tomentum definitely thicker on reddish lateral borders and along hind mesonotal borders. Scutellum slightly greyer apically, almost uniform. Hairs over mesonotum practically entirely black, erect, a few pale apically, hairs on humeral lobes almost all pale, on scutellum all dark but especially long. Pleura as in female.

Abdomen shining black-brown, hind margins grey tinged pinkish, especially on first and second tergites, and expanded laterally on first three tergites (least on third). First tergite mostly grey tomented but only thinly so medially, with many pale hairs and some black ones sublaterally, also a median tuft of shining pale yellowish hairs. Second tergite with very faint median triangles of tomentum and very small tuft of yellowish hairs. Third tergite with more conspicuous pale hair tuft, and triangle of grey tomentum; on the fourth and successive tergites there are only a few pale hairs medially and very little tomentum. The only median triangle visible macroscopically is that on the third tergite. Pale hind margins and lateral triangles have white hairs, elsewhere hairs short, black, numerous. Venter slightly more shining than on female, hairs longer and more numerous, but not greatly different.

Legs coloured as in female, but more hairy. Hairs on hind femora mixed but predominantly white.

Wings: Veins more yellow-brown; yellowish tinge present in membrane basally.

Measurements ♀ Length without antennae 10·5—14 mm. Wing length 9·5—10·5 mm. ♂, Length 12·5 mm. Wing length 10·5 mm. Frons index 4·1—3·8.

Distribution: known only from a forested area of the Vumba in the Umtali District of Rhodesia.

Holotype ♀ in the Natal Museum; N. Vumba, Umtali District, Rhodesia, D. M. Cookson, 27.10.63. Paratypes: 1 ♂ and 1 ♀, 27.10.63 and 10.11.63 respectively, from the same locality.

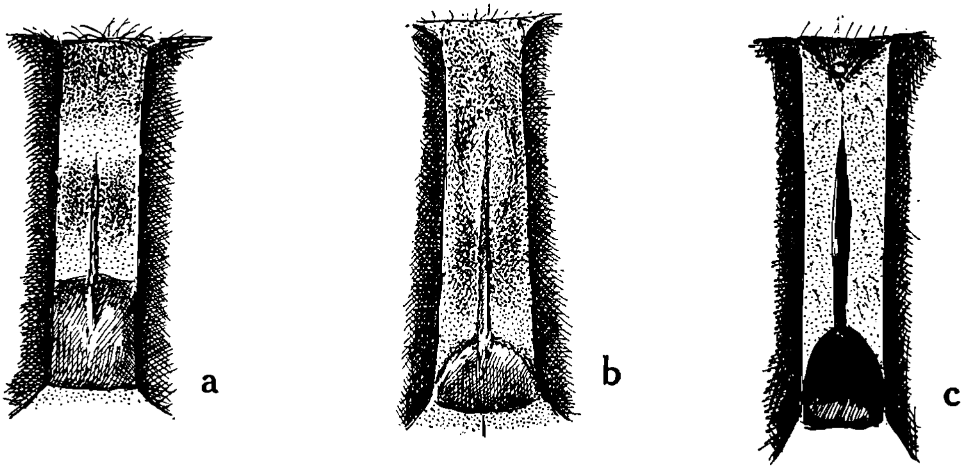

Fig. 17. Frons of *Cydistomyia* (*Amanella*); (*a*) *ingridina*, (*b*) *ignota*, (*c*) *emergens*.

KEY TO THE SPECIES OF THE SUBGENUS *AMANELLA* WITHOUT A DEFINITE, DEEP, HAIRLESS GROOVE ON SECOND PALPAL SEGMENT.

(For the species with grooved palpi see Oldroyd 1954, p. 75.)

1. Abdominal pattern made up of median triangles and large, irregular sublateral triangles or spots; medium sized, yellow-brown flies 2

——Abdomen with pattern of median and lateral triangles, which may be indicated only by pale or golden hairs, or no pale triangles may be apparent. Wings clear or tinged with brown, except *medialis* which has infuscated veins and is very dark brown with a bold white abdominal pattern 3

2. Distinct infuscation along wing veins; third antennal segment narrow, without dorsal angle; second palpal segment very swollen at base; from lower montane forest on the Pondoland coast .. .. **pondo** (Oldroyd)

——Wings brownish but without infuscation along the veins; third antennal segment not shaped, with slight, but definite dorsal angle; second palpal segment not abnormally enlarged basally, slightly swollen only, otherwise elongate and pointed; from forest along Transvaal escarpment .. .. **ignota** n.sp.

3. Abdomen brown or dark brown with conspicuous, clearcut pattern of median and lateral triangles; tomentum of frons not uniform but with pattern of brown patches... 4

——Abdomen without conspicuous triangles; if small grey triangles are present, abdomen blackish or charcoal coloured and frontal calli black; triangles usually very indistinct or made up of pale hairs (which are often lost through rubbing) 5

4. Abdomen dark brown; tergites with narrowly separated, large grey median and lateral triangles, and wide pale hind margins; lower callus slightly bulging, shining brown; third segment with slight but definite dorsal angle; second segment of palpi with long white hairs at base, otherwise short, black hairs; legs reddish-brown . . . . **ingridina** n.sp.

——Pattern on tergites very bold, contrasting, very dark brown and white; median triangles widely separated from small lateral ones, hind margins narrowly pale; lower frontal callus flat, subshining, dark brown; dark third antennal segment with very prominent dorsal angle; second palpal segment of palpi with mostly short black hairs, a few short white ones at base; legs dark .. .. **medialis** (Oldroyd)

5. Abdomen black-brown (appearing charcoal-coloured macroscopically) or dark sepia-brown; frontal calli definitely jet-black (not brown or reddish as in the dark form of *imbecilla*) 6

——Abdomen usually with some orange-brown at least laterally at base may be only a narrow strip, or may cover entire basal three segments except for median black spot on each of first two tergites; occasionally entirely dark, but then frontal calli are only narrowly separated from eye margins and are slightly reddish, and third antennal segment has only moderately prominent dorsal angle 7

6. Abdomen blackish-brown, small but distinct greyish median and lateral triangles with tufts of white hairs; black lower callus definitely higher than broad, not nearly meeting eye margins; tibiae brown but not contrasting noticeably with dark femora; third antennal segment with very steep dorsal angle, orange-brown in colour and terminal segments darkened but not absolutely black; larger, broader, more robust species, 11—13 mm. in length; from Vumba Mountains in Rhodesia .. .. **cooksoni** n.sp.

——Abdomen dark sepia-brown, median triangles on tergites elongate but indistinct, more pronounced when hairs are present, united into very poorly defined stripe; lateral borders of tergites diffusely paler, light hairs (if present) forming lateral triangles; black lower callus approximately rectangular, not quite meeting eye margins; very dark femora contrasting with reddish tibiae; third antennal segment bright orange, with moderate dorsal angle, contrasting in colour with black terminal segments; fairly small species, 9 mm. in length; from Grahamstown in the Eastern Cape Province . . . . **emergens** (Oldroyd)

7. Wings stained along veins; abdomen orange to a variable extent on first two tergites; hind margins narrowly whitish .. .. **amblychroma** (Speiser)

——Wings clear; abdomen very variable in colour, from completely dark, to orange laterally at base leaving dark median stripe, to orange extensively at base with only a dark spot on basal two tergites; narrow yellow hind margins to all tergites; frontal callus narrowly separated from eyes; third antennal segment long and slender with only moderate dorsal angle .. .. **imbecilla** (Karsch)

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